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Advertising and Trade Expansion.

THE Advertising Convention recently held at Olympia has furnished a great deal of matter more or less interesting to those who believe in advertising and better salesmanship methods as means for developing our trade. Those who study such proceedings must not despair if they fail to find much that is new or original in the ideas that receive expression. So far as our knowledge—modesty forbids our dwelling upon its extent—of the subject goes, we believe that some of the most practical information regarding efficiency in technical Press advertising will be found in the reports prepared by the gentlemen who judged the entries to our two Advertisement Competitions. All who are responsible for the preparation of advertising matter for the ELECTRICAL REVIEW, or other journals of our class, would do well to have those reports at hand for periodical study.

Advertising is, of course, a subject making a direct appeal to a special section of our readers, but it also possesses a definite practical interest for most of the remainder because the advertising and editorial pages are supplementary to each other in forming a complete record of work and movements at a given period.

One of the many papers read at Olympia was contributed by Mr. Frank E. Dadd (with Mr. C. W. Eve in the chair) on the "Improved Advertising of Engineering Products." For a long while now the engineering industry has been in a deep trough of depression, and we all long to hasten its recovery. The author did not for a moment suggest that advertising could exercise such a supernatural influence as would remove the causes of that depression, but he thought that greater attention paid to it might help us to regain some of the trade lost all those years ago when we were pre-occupied with munitions production, and might in addition help us to open up fresh markets. Mr. Dadd holds it remarkable that British engineering firms realise so very slightly the possibilities of various forms of advertising; he says that the great majority of firms fail to appreciate the value of such a trade weapon, and blames many of them for spending their money unwisely and then failing to understand why they are dis-

appointed with the results. It certainly is remarkable how men who are so ready to uphold American methods before our view fail to recognise the altogether more progressive spirit that characterises American advertising policy and expenditure.

Many quite familiar pieces of advice were given at the meetings at Olympia, but there is such a constant procession of men into and out of the publicity, salesmanship, and advertising departments of industry that such counsel may well be repeated periodically. We quote on another page of this issue some extracts lifted from the many speeches which were delivered during the series of Convention functions. Let us mention here a few of Mr. Dadd's points.

When advertising costs a considerable sum annually, it requires a highly-skilled man to direct it successfully—in brief, a man who knows his job and is capable of judging what is a good advertisement, one that will "pull" orders; he must know how to plan a campaign and how to prepare advertisements. Suitable journals for the markets to be reached must be selected and the advertisement must be prepared from the purchaser's point of view, telling him the service that the goods will render rather than describing them. Most of the advertisements in the technical Press (this is, of course, the author's statement, not ours) are uninteresting and uninformative, containing no news value whatever. The advertisement which has a selling value contains *facts*. Mr. Dadd said he could name half-a-dozen British engineering firms which had adopted this kind of advertising, and their names stood out prominently from the uninteresting trade cards that surrounded them. Cheap humour was worse than useless in technical advertising—facts were what was wanted, but they must be actual facts, for truth was all-important. If facts were given—real news of what machinery would do—advertising pages would be more closely studied by buyers. It seemed illogical to refrain, because trade was depressed, from telling people what one's goods would do; surely that was the very time when the greatest effort should be made to secure new customers.

Mr. Dadd devoted the rest of his paper to a discussion of lines along which advertisers could co-operate in their efforts to ascertain what were suitable media for their purposes, their circulations, classes of readers —all information that an association could obtain better than individual advertisers. He had a word to say regarding the mistakes made by some advertisers in depreciating the product of others; by so doing they might also injure the market for their own goods. Apart from the latter possibility, we think mutual attacks and criticisms are to be deprecated. The buyer has no use for them—may not even understand them; they may entertain a special circle, but hardly help the man who is out to know what to buy and from whom to buy it.

Mr. Dadd closed with an appeal to the newspaper Press to bring its immense power to the aid of British engineering industry by doing some really fine propaganda work to the world at large on the wonders of British engineering.

Electrical Circles.

WE are able to give this week an outline of the plan to be followed in the E.D.A. Circle Campaign which opens in October next and continues until the following March. We hope that the publicity that is being given to-day will not be less fruitful because the holiday spirit is abroad and many of our readers are entering upon their well-earned rest from business matters. We shall return to the subject, setting forth its details more fully, between now and the actual opening of the campaign. Our main hope in describing the scheme in July is to let it be known as early as possible that the E.D.A. authorities have circulated their series of pamphlets to many thousands of people who they know are interested in the effort, and that they are prepared, indeed only too willing, to forward a set to anybody who wishes to be in any way identified with the working of the Circle Campaign. Reference to an article appearing on a later page of this issue will show that the Circle Campaign, while forming a natural sequel to the 1926/1927 W.O.B. Campaign, will have a wider object—it will not be limited to wiring the homes of the people for lighting; indeed, it is to be a campaign for all-electrical development conducted by E.D.A. with E.D.A. funds, whereas the last campaign was a joint affair of E.D.A. and E.L.M.A. Three things may be said here and now: first, the movement for 1927-1928 commences with 123 Circles in being, whereas a large part of the last season's work consisted in the preliminary work of their formation; these are ready to get to work at once and many more are expected to be formed. There will be a central organising principle and spirit, but local circles will be allowed the exercise of their own initiative and enterprise. The more there is of these qualities the better from the local co-operative success standpoint. Secondly, the campaign will include national electrical advertising, national luncheons, lecture panels, a national electric week, demonstration electric houses, a national domestic canvass, and direct mail publicity. Thirdly, we hope that those who were unable to co-operate in last year's very successful activities will without delay make up their minds to be in this time, right from the beginning. By putting heads together in these local electrical circles, it should be possible to bring substantial advantage to electricity supply undertakers, electrical contractors and traders, and of course, to manufacturers.

Lecture Theatre Kinematography.

THE interest taken in the proceedings at the recent E.H.P. Conference at Paris was on several occasions stimulated by the illustration of papers with kinematograph films, which it was easy to do since the restrictions imposed on the use of projectors in France are far less stringent than in England.

Mr. R. Borlase Matthews has lately been using a hand kinema camera with films 16 mm. in width, instead of the standard 35-mm. film, with very effective results, and he had intended to test the projection of such films on a scale suitable for a lecture hall, since the cost of films of this class is only one-sixth that of the standard pattern. Mr. W. C. Binz forestalled him, however, by displaying similar films at the Paris Conference, and the exhibition demonstrated that this class of film can be very satisfactorily shown in this manner; moreover, it is non-inflammable and hence there can be no restrictions to its display anywhere. Through the combined courtesy of E.D.A. and E.L.M.A. Mr. Matthews demonstrated this system of projection this week in the new kinema theatre that E.L.M.A. has installed at 15, Savoy Hill, London, proving that it should do much to facilitate the kinematograph illustration of papers and lectures at the meetings of institutions and similar functions.

The British Industries Fair.

THE Prime Minister last week said that the British Industries Fair deserved success—and had secured it. From reports which we have received from the Department of Overseas Trade and the Birmingham Chamber of Commerce, the respective organisers of the London and Birmingham sections, we gather that next year's Fair will be a greater success than ever.

We are especially looking forward to a bigger and more representative electrical display, and it seems as though our hopes will be fully realised; 23 firms which have not previously participated are to make their appearance, and no doubt the large majority of last year's exhibitors will be there.

We would remind those of our readers who are interested in the London section that to-morrow is the last day upon which space can be guaranteed at the White City.

Factory Lighting.

An interesting electric lighting installation has recently been completed at the Ruberoid Company's factory at Brimsdown, where, as the result, increased output has already been observed.

THE recently completed lighting installation at the large works of the Ruberoid Company at Brimsdown, affords a good example of the advantages to be gained by the application of modern high standards of illumination in factories. Owing to the dark material handled in this factory, the degree of illumination required is necessarily very high, and it is interesting to note that the result of the improved lighting is already evidenced by increased output.

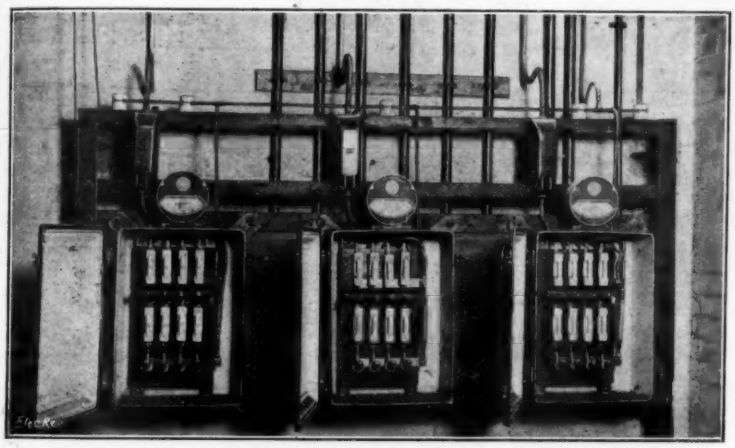


Fig. 1.—Main Distribution Board.

The original plant was installed in 1910, and consisted of a 10-kW, 110-V dynamo driven by a single-cylinder horizontal steam engine, taking steam from the main boilers, which also served as a mechanical driving unit for some of the machinery in the factory. Due to expansion, it was found that the lighting load had increased to about 12 kW, and that the drop in pressure at many of the lighting points was as much as 40 per cent.

Numerous instances of the casual methods of wiring of early times, such as unsoldered joints drawn into conduit, and, in one case, conduit passing directly through the flue of a chimney, were found to exist, and it was deemed advisable to rewire the whole installation, the dynamo being left for use in the case of emergency.

Power had for some time been taken from the mains of the North Metropolitan Electric Power Supply Co. A 25-kW, three-phase transformer has now been installed in a central position, and supplies the lighting circuits at 110 volts, through a main distribution board, fig. 1, situated in the boiler house where an attendant is always available. From this board the main distributors are run in conduit up to convenient positions, whence they are taken overhead on porcelain insulators to the various sub-distribution boards.

As a protection against the destructive fumes with which the surrounding atmosphere is charged, Maconite insulated conductors have been adopted throughout the installation; these have also proved advantageous due to the permanent flexible nature of the insulation when subjected to the high temperatures which exist in many parts of the factory.

In places where volatile liquids of an inflammable nature are used, further precautions have been taken to prevent the outbreak of fire by adopting special gastight fittings. To enable any outbreak of fire to be dealt with promptly and efficiently, a "pilot" circuit has been installed which, by the operation of one switch in the boiler house, where an attendant is always at hand, produces general illumination over all parts of the factory and grounds; there being no accessible local switches in this circuit, no lights can be turned off by accident. An interesting feature of this emergency lighting is the 1,000-watt lamp shown in fig. 3, slung at a height of 50 feet between a chimney stack and another building, thus effectively illuminating all the parts of the yard shown in the foreground.

From illustrations Nos. 2, 4, and 5 it will be noted that the illumination throughout is of a very high standard, in many cases rising to 10 or even 20 foot-candles. This has been economically obtained by the careful selection of suitable shades and reflectors, the majority of which are of the three types illustrated in fig. 6, manufactured and supplied by Benjamin Electric, Ltd. Fittings of the R.L.M. or factory type "A," which complies with the specification recently issued by the B.E.S.A., are erected in accordance with the Home Office regulations and give a pleasing effect, free from glare, the illumination produced by the correct spacing and height being remarkably even, as will be

Fig. 2.—Example of Even Illumination.

noted from fig. 2, which was photographed from approximately the eye level. Fig. 4 shows the high illumination allowed for carpenters' and similar work. Extensive or dispersive shades of the "B" type have been adopted for the smaller power lamps where their height has not allowed of wide spacing. Type "C," which is gastight, is installed only where the protection indicated is necessary.

Fig. 3.—Factory-Yard Lighting Equipment.

Fig. 5 illustrates the excellent effect produced by using fittings of type "A" at a considerable height; it will be noted that practically no shadows exist and that a large railway truck in close proximity to the wall does not cast sufficient shadow to prevent anybody between it and the wall being clearly visible.

The improvement in illumination and freedom from glare has been remarked upon, it is claimed, by all those who have seen the installation. The improvement has been obtained for a relatively small increase in the consumption of electrical energy.

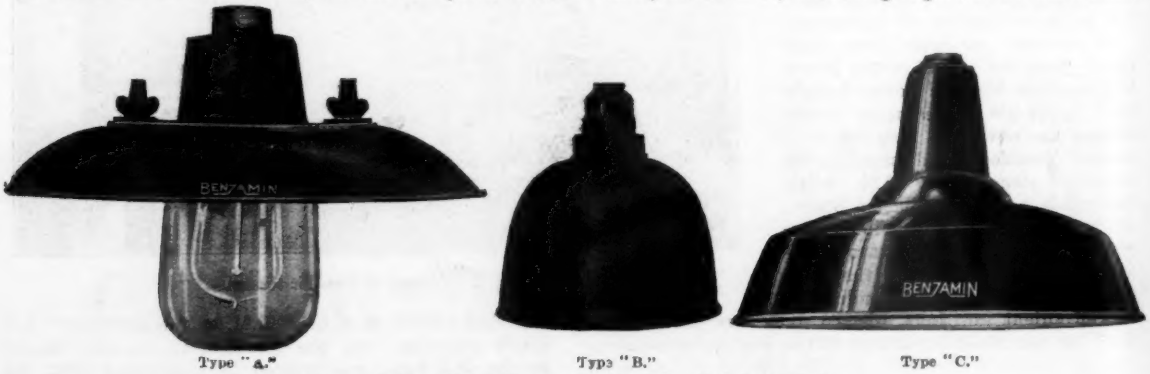
The work on this installation was carried out under great difficulties. The erectors were much hampered by moving shafting and belting, and at times noxious fumes and high temperatures made it necessary to stop work every few minutes. It was necessary for the old system to be kept in operation until the new work was finished, which meant many temporary connections.

The real advantage of the independent supply was fully noticed when a general overhaul was ordered during the winter, and the boilers were shut down for "scaling" after a good deal of the new installation had been put in. Satisfactory illumination was maintained for the repair work.

The work was carried out by the contracting branch of the North Metropolitan Electric Power Supply Co., Ltd., to the plans and specifications of Lt.-Commander Haydn T. Harrison, M.I.E.E., and his colleague, Mr. Balbi, A.M.I.E.E., consulting engineers for the scheme, to whom we are indebted for the above particulars and the photographs.

Fig. 4.—Lighting in Carpenters' Shop.

Fig. 5.—Practically Shadowless Illumination.



Type "A." Type "B." Type "C."

Fig. 6.—Lighting Fittings Employed for the Ruberoid Co.'s Installation.

The Induction Ammeter.

The Principles Involved and Means of Improving the Design.

By FRANCIS E. J. OCKENDEN.

IN a paper read before the Institution of Electrical Engineers, and published in its *Journal*,* it is pointed out that, whereas the well-known induction watt-hour-meter is a very satisfactory instrument and one which, however designed, is, to a large extent, self-compensating as regards temperature changes, this is by no means the case with induction

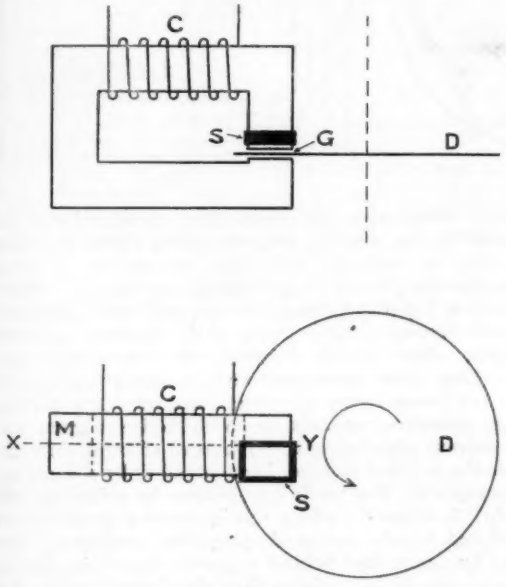


Fig. 1.

ammeters, voltmeters, or wattmeters of the indicating pattern, and that the latter are inherently much less accurate than the corresponding moving-iron and dynamometer patterns. At the same time, there are many cases in which the bold 300 deg. scale is valuable, particularly for feeder ammeters and in other cases where the instrument has to be seen at a considerable distance, so that the necessity of taking advantage of any features either in theory or practice which would enable self-compensation for variation of temperature and frequency to be obtained becomes apparent. The success which has attended the author's efforts in this direction is evidenced by the fact that, whereas induction ammeters are relegated by British Standard Specification 89 to second-grade accuracy, which allows a change of reading of 4 per cent. for each 10-deg. change of temperature and an error of 1.25 per cent. for a 5-per cent. change in frequency, the improved ammeters described hereafter exhibit errors of less than one-tenth of these figures.

The information which is available as to the design of induction meters of the indicating, as distinct from the integrating, pattern is very meagre, so that it is thought that some consideration of the principles involved, together with the means adopted to improve these instruments, will be of interest.

The earliest instruments of this type were of the "shaded-pole" pattern, and since this design contains within itself all the essentials of subsequent developments, it is well to consider it in some detail.

Although familiar to many, a typical lay-out is shown in fig. 1. A rectangular core, having a small gap, G, cut in it, is magnetised by a coil of fairly large gauge wire, C. The flux circulating round the magnetic circuit crosses the gap, and thus cuts the plane of the aluminium disk D at right angles, inducing in the disk, by transformer action, eddy currents which circulate round that portion of the disk which is immediately under the pole face. Beyond a slight warming of the disk, due to the energy dissipated in it, no further effect is produced. If, however, one portion of the pole is surrounded (or shaded) by a single turn of copper, the flux in that portion is caused to lag behind that in the unshaded pole, and interaction between the eddy currents and the lagging flux causes the disk to experience a torque which is proportional to the magnitude of the two fluxes and to the sine of the phase displacement between them. Since the effect of the shading ring is at once to reduce the magnitude of the flux within its boundaries, as well as to cause a phase displacement, it is necessary to consider, in more detail, the exact mechanism of its operation.

It will be noticed that, except for a small gap (which merely increases the reluctance of the magnetic circuit), the core shown in fig. 1 has a marked resemblance to a current transformer, the magnetic circuit of which is divided into two parts, that above the dotted line XY having no secondary winding, resembling a current transformer on open circuit, and that below having a secondary winding closed on itself, resembling, in fact, a current transformer on short circuit. Both transformers have, however, a common magnetising, or primary, current, I. The vector diagrams for a transformer under each of these conditions are shown in fig. 2. (A) shows the vector diagram for the open circuit condition of the secondary winding, where ϕ_A is the flux produced by the magnetising current I_{m_1},

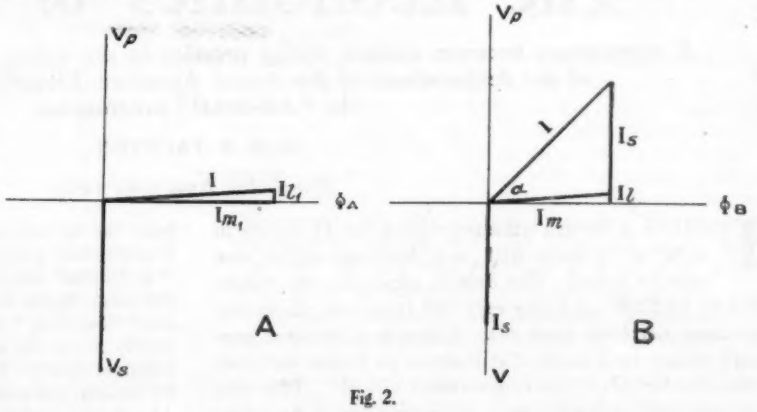


Fig. 2.

I_{l_1} is the loss component and I the total magnetising current. Since the reluctance of the air gap is large and the core losses I_{l_1} negligibly small, I_{m_1} may be taken as equal to I and ϕ_A as proportional to I, that is, the flux is in phase with the magnetising current I and directly proportional to it.

In diagram (B), ϕ_B is the flux produced by the true magnetising current I_m, and V the voltage induced in

* "Some Recent Advances in a.c. Measuring Instruments," by Lt.-Col. K. Edgcumbe and Mr. F. E. J. Ockenden. *Journal*, Inst. Electrical Engineers, Vol. 65, page 553. (See also ELECTRICAL REVIEW, February 11th, 1927, page 232.)

the secondary winding (or, in the case of the induction movement, the shading winding). The current I_{s1} induced in this winding is assumed for the moment to be in phase with V, and calls for a corresponding primary current I_s. The core losses I_l, although shown, are practically negligible, and the total primary current I is clearly the vector sum of I_s and I_m; but the two halves of the transformer have, in point of fact, a common magnetising coil, so that I must be the same in both cases. Imagining diagrams (A) and (B), therefore, to be superposed in such a manner that the vectors I coincide, it becomes apparent that the vectors ϕ_A and ϕ_B differ in phase by an angle nearly equal to α, the angle between I and I_m, and that their magnitudes will be proportional to I_{m1} and I_m, *i.e.*, proportional to I and I_m, since I is practically equal to I_{m1}. The torque, therefore, is proportional to $I\ I_m \sin \alpha$.

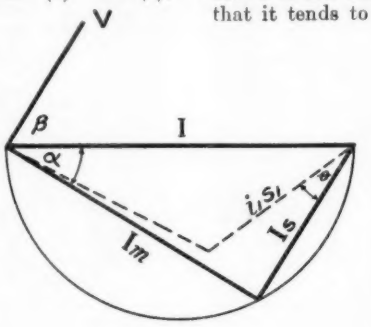


Fig. 3.

Provided that the reactance of the shading ring is negligible, *i.e.*, I_s is always at right angles to I_m, then the effect of various degrees of shading is readily seen from the simple circle diagram shown in fig. 3. I, the total primary current, is split up into any two components, I_m the magnetising ampere-turns and I_s the shading ring ampere-turns, α being the resulting phase displacement between I and I_m.

As given above, the torque (T) is equal to $KII_m \times \sin \alpha$, where K is a constant depending on the frequency and the conductivity of the disk,

but $I_s = I \sin \alpha$

and the torque therefore $= KI_mI_s$, which is a maximum when $I_s = I_m$, in which case $\alpha = 45$ deg.

The volts induced across the winding by the flux are shown as V, at right angles to I_m and at an angle $(90° - \alpha)$ from I. The power factor of the unit is, therefore, plainly $\cos \beta$, the watts dissipated being given by $V\ I \cos \beta$; but V is proportional to the flux, therefore $V = K\ I_m$. But $\beta = 90° - \alpha$, and therefore watts $= v\ I \cos \beta = KI\ I_m \sin \alpha = T$.

That is, for a given current I, the torque is proportional to the watts developed in the shading ring and is a maximum when the phase angle of this unit is 45°.

The above reasoning assumes that the shading ring forms a non-inductive load. Unfortunately, however, this is far from being the case, its leakage inductance being very considerable. The cause of this is clearly shown in fig. 4. The main flux produced by the magnetising coil C is shown circulating round the core and threading the shading ring S. (The leakage flux from coil C is not shown, since it is only of importance in that it tends to increase the inductive drop across the coil.) Similarly, the main flux produced by the current in the shading ring circulates round the core, linking up perfectly with that induced by C, but a considerable portion of the shading-ring flux is "short-circuited," partly through the available air paths and largely through the pole-pieces of the adjacent unshaded magnet, shown in the diagram, for convenience, end on. This effect is accentuated in many designs by the two poles being in actual contact. The shading ring, therefore, behaves as an inductive burden and the current circulating in it, instead of being in phase with the induced voltage, lags behind it by a considerable angle θ. The result may be seen by referring back to fig. 3, where the phase displacement α is also shown produced by the dotted shading-ring current I_{1s1} lagging by an angle θ behind I_s (or V, since V is parallel to I_s) It will be noticed that the length of I_m has been greatly reduced with a corresponding reduction in flux, phase displacement, and torque.

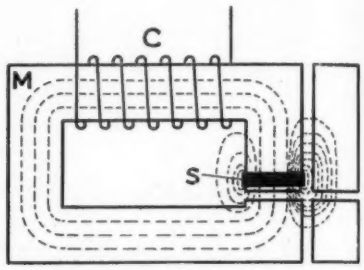


Fig. 4.

(To be concluded.)

The Economics of Wiring.

A comparison between electric wiring practice in the U.S.A. and England, in the light of the deliberations of the recent American Electrical Conference on the "All-metal" programme.

By H. R. TAUNTON.

(*Concluded from page* 140.)

IMAGINE a British wireman wiring for 17 outlets in a day of 8½ hours with, say, lead-covered, or even cab-tire cable! The British wireman, who thinks two of his kind are doing very well if between them they manage anything more than a couple of screwed conduit points in a day! Yet there is no better workman than the British, if he cares to exert himself. Take him across the Atlantic and he would beat American figures; for they are average figures, and he is certainly above the average skilled immigrant from Europe. Why, then, the extraordinary difference in results? Is it the difference in trade union outlook? Is it, as the other side would contend, due to the incentive of higher wages and a higher standard of living? Or is it simply the extra stimulus of an atmosphere of pep and ozone?

At attempt to answer these questions would only lead us to controversy; let us return, then, to the Electragists' pamphlet.

A further comparison is given of the cost of wiring the same house on the same two systems, but now to the "Red Seal" schedule. The proportionate costs are pretty much the same; and the interest here lies in the schedule itself. For this six-room house no fewer than 61 outlets are scheduled. It is given 23 fitting points, 14 plug points, and five 660-watt plug points, the whole controlled by 15 single- and 4 two-way switches. (Incidentally, it does not appear that the plugs are, as our own rules require them to be, switch-controlled, unless the word "convenience" implies a switch-plug combination.)

There is a lesson in the generous allowance of outlets provided by this "Red Seal" schedule. In England, in the absence of some such standard, there is always

a tendency on the part of a competing contractor dealing with an uninstructed customer, to cut his schedule down to the barest limits in order to keep the lump sum of his tender as low as possible. He knows that his competitors, particularly the smaller ones, are likely to do the same, and that the customer, who has not been educated to the advantages of plenty of plugs and switches, will fasten on the total of the tender and will look askance on any explanation of a higher figure. So a contractor is apt to shirk the difficulty of convincing a man—with a foreseeing eye on a heavy quarterly account for electricity—that the extra convenience is worth the extra outlay; and the customer suffers, the supply company suffers, and the contractor himself suffers, not only in his immediate sale, but in the possibility of future sales of electrical apparatus: all for lack of a little energy and courage; or perhaps it would be fairer to him to say, for lack of effective propaganda, and a recognised standard of electrical convenience.

Having proved their case so far as the "All-Metal" programme is concerned, the Electragists proceed to discuss wiring costs in general.

Dealing first with labour, a graph is given comparing electricians' rates with general building labour rates and the cost of living up to the middle of 1926, the year 1913 being taken as 100 per cent. datum. A similar graph for Great Britain could be easily compiled and would be instructive; though with us, of course, the electrical-wages curve would follow the cost-of-living curve. In America, up to 1920, wages rose less quickly than did the cost of living, electrical rates following closely the average rates in the building trade, though always slightly above them. In recent years, however, wages have risen more rapidly than the cost of living, the last figures shown being 240 per cent. for electricians in 1926, as against 232 per cent. in 1925, when the building trades' average was 228 per cent., and the cost of living 176 per cent.

Since 1920, then, the worker has been able "to buy more and more with his wages. Such a condition is becoming true of almost all classes of wage-earners. If it does not go too far, this is not an unhealthy condition. On the contrary, it is most healthy for a nation with such a capacity for production in that it puts the great majority of the families of the country on a basis where they can for the first time afford such luxuries as electrical comforts. A wage scale that is merely a living wage will not permit any great growth in domestic consumption of energy. We cite any of the European nations. The cost of wiring is exceedingly small (*sic*), but the consumption per family is smaller still because the family income is a living wage."

Dealing next with material, further graphs are given showing material costs since 1914. One of these, relating to armoured cable and conduit, in which the Electragists are interested as protagonists of the "All-Metal" system, shows that ½-in. conduit had risen in 1926 to 164 per cent., while armoured cable had actually fallen to 55 per cent., as compared with the 100 per cent. datum of August, 1913. Other graphs show that, in (July) 1926, rubber-covered wires were 15 per cent. below the 1914 price, though bare wire was 20 per cent. above; incandescent lamps were as much as 29 per cent. below 1914 prices, and a further reduction is recorded in September, 1926; and so on. Altogether, figures are given for thirteen representative items, covering a large percentage of the total of electrical supplies manufactured.

In most classes of material, of course, an increase is shown, but the low indices of rubber-covered wire and lamps, combined with their large volume, serve to make the composite figure exceptionally low. In July, 1926, it was no more than 113 per cent.; and this is compared with the 154 per cent., the index of wholesale prices of all commodities, and the 187 per cent., the index of building material prices, officially recorded by the U.S. Bureau of Labour.

It is evident from these figures that the cost of labour—wiremen's wages—is the dominating factor in wiring costs in America, as it is with us; and the Electragists make the point that the wiring system requiring the lesser amount of labour—meaning, of course, their "All-Metal" programme—is therefore the most economical. Moreover, since wiremen's rates have kept in line with the increase in building labour rates, while the cost of wiring materials is far below that of general building materials, it is obvious that "the relative cost of wiring in terms of building costs is lower to-day than ever in the history of building."

The position is very much the same in England. The cost of the electrical installation is a ridiculously small proportion of the total cost of a building; and it might well be more, with as much advantage to the purchaser as to the contractor. The labour cost, as we know, varies exactly with the cost of living, and the cost of wiring supplies is certainly as much below that datum as that of general building supplies is above. These are assertions made without the foundation of actual figures; but there can be little doubt that if someone with access to a file of old catalogues would take the trouble to draw out a series of representative curves, tracing the rise and fall of various classes of electrical materials from 1914 to date, they would be found to tally very closely with the American ones. In both countries manufacturers draw on very much the same markets for raw materials, and are subject to very much the same world economic conditions.

Labour and material having been dealt with, we have now to consider "overhead." In the electrical contracting business standing charges are necessarily and exceptionally low; "lower," says our pamphlet, defending its costs against the other members of the conference, "than those of the wholesaler, the manufacturer or the central station. . . . The contractor is forced to keep his overhead low in order to remain in business"—a statement with which every contractor will sigh agreement!

The figures of eighteen contracting firms, with turnovers varying from $10,000 to over $400,000 a year, are analysed in detail. (They originally appeared in the June, 1926, issue of the *Electragist*.) Nine of these firms show a profit on the year's trading; the rest, a loss. Those who show a profit are those whose standing charges are low. Their average "ratio of overhead to prime cost of labour and material" is shown to be about 35 per cent., while that of the unsuccessful firms is shown to be over 40 per cent. The figures actually vary from a minimum of 30.6 per cent. in the case of the largest firm, a winner, to a maximum of 58.8 per cent. in the case of a $50,000 firm, which was naturally a loser.

The firms which had to add such high percentages to their labour and material costs in order to cover standing charges could hardly hope to win competitive contracts; and as even these percentages are (in America) considered low, as compared with those of general trading, it is clear that the public there is not being asked to pay unduly for its electrical work. The moral of all this is pointed for us: "The electrical contracting business does not admit of many frills. The only way that men can keep in business is to keep down their expenses of doing business."

The full analysis of the standing charges and the profit and loss statement is interesting, but would take up too much space to reproduce. An item which assuredly figures in the costs of few British contracting firms is "Automobile." Even the 10,000-dollar firm spent $460 under that heading, with a further $55 for depreciation, while the 400,000-dollar concern puts it down for $3,735, with $916 depreciation.

The proportion of labour to material varies, pretty much as it does with us, according to the size and character of the firm; but the average, in spite of the high labour rate, is definitely lower. With us, labour is commonly about 35 per cent. to 45 per cent. of the total prime cost of a job. In America, it is shown to

be sometimes as low as 10 per cent., and rarely as high as 33 per cent.

In a recent issue of the ELECTRICAL REVIEW a jesting bard wrote of a contractor as a—

"Poor wretch who relies for his living
On the discount for cash he gets,"

and it is amusing to observe that one of these American contractors shows a loss on his actual sales, yet manages to come out $825 to the good, by virtue of cash discounts earned in the year!

"It is generally admitted that in a competitive business a 10 per cent. profit is not unfair. . . . What," ask the Electragists, "do the contractors get?" The nine successful firms earned one-half of 1 per cent., eight-tenths of 1 per cent., 2 per cent., 3.5 per cent., 4 per cent., 4.6 per cent., 4.7 per cent., 6.5 per cent., and 7 per cent., the highest figure being that of the smallest firm, the owner of which "worked with the tools," and had no office staff. Nobody can claim that these are exorbitant profits; indeed, most of them are ridiculous. "No man can continue in business long with less than 1 per cent. profit," says the pamphlet modestly; but obviously something more than that is needed to tempt a man to undertake the toil and risk of competitive contracting, when he can sit at home at ease and draw a safe 5 per cent. from gilt-edged investments. It must be remembered, however, that the percentages quoted above are on turnover, which may be, and generally is, a very different figure to the capital actually employed.

It is interesting to compare these American figures with those quoted by Mr. J. Kirkham in his paper read recently at the E.C.A. Conference. The four firms whose figures he analyses happen all to have shown a reasonable profit—no doubt it would have been less easy to obtain figures from firms which would have had to confess a loss—but it is possible that if 18 firms could have been taken at random, their profits would have been shown to be as low or as negative as those quoted by the Electragists. No useful comparison, therefore, can be made so far as profits are concerned. If we turn, however, to the standing charges, we find that the average of four British firms, for "works on-costs" and "administration on-costs" combined, is no more than 28.3 per cent. of the prime cost of labour and material, the lowest being actually 24.1 per cent., and the highest 35.8 per cent.* These are low figures compared with those given for the "successful" American firms, quoted above as an average of 35 per cent. The actual figures for the four American firms whose turnover most closely corresponds with those given by Mr. Kirkham—Nos. 5, 6, 7 and 8 of the Electragist pamphlet—are actually 30.9 per cent., 37.2 per cent., 36.1 per cent., and 31.5 per cent.

It would seem, therefore, that successful British contractors contrive to manage their businesses more economically than successful American ones. If, then, the Electragists prove their case—as they do—that their public is getting fair value from them in their installation work, it is apparent that our public is getting even better value from British electrical contractors, inasmuch as it is getting a larger proportion of bare material and labour, and paying less towards unproductive costs.

Having proved their case, that any lack of development in the electrical industry is not due to high installation costs, the Electragists go on to suggest other possible causes of the stagnation of which the supply companies complain. And they turn the tables by blaming the supply companies themselves. The American companies, it seems, compete against the contractor—a familiar bone of contention—support cheap-jack competition, and do all they can to lower wiring standards.

"When a utility (supply company) is thus engaged in the wiring business, it will find that the customer looks to it for all kinds of service. . . . Now if we are to believe the utilities that the domestic load pays a profit of only about 5 per cent., and that the average domestic bill for a year is less than $30.00, it is apparent that $1.50 does not allow much room for free service on wiring. No utility can thus engage in the wiring business without losing money"—in England, at the expense of the ratepayers!

Apparently the commercial departments of the American supply companies are held responsible for the policy criticised, by which consumers are secured by reducing prices in everything but the rates for energy. The Electragists proceed to argue the case for reduced tariffs as a main factor in electrical development, and conclude with an appeal for a general adoption of the "Red Seal" programme, and for more intensive propaganda.

They assert that education of the public is of primary importance, and low installation costs "of negligible influence where the spread of wiring is concerned." Where local propaganda has been most active—propaganda which never mentions prices—the average number of outlets is highest. In Toronto, "the home of the Red Seal," more than 200 house builders are committed to use Red Seal jobs in all houses they build, and 41 per cent. of the houses erected there during the first seven months of 1926 are to Red Seal specifications; with the result that the percentage increase of monthly current consumption in "Red Seal" houses with "ranges" is 302 per cent., and in houses without ranges, 186 per cent. "Of course, it must be remembered that Toronto has a very attractive inducement form of rate."

Similar facts are cited from a score of other cities. A typical report is that from Providence: "In 1916 the average was 15, now it is 26 outlets. Opinion as to cause of inadequacy of jobs: (1) Public lacks information; (2) public has not been 'sold' the idea for need of adequacy; (3) the public wants an adequate job, but thinks it already knows what 'adequacy' is. . . . My opinion is that the public doesn't know anything about what constitutes a convenient layout of home wiring, and very little has been done to inform it. All wiring seems to be done on price. . . ." There is a strong family resemblance in this particular between the American and the British public!

We need not follow the American Electragists further in their domestic troubles—they are too much like our own to have the interests of novelty; we cannot do better than conclude with another quotation:

"We are convinced that better wiring will be done, better customers will result and larger lighting bills will come if the 'cheap-price' contractor is discouraged and the 'quality-wiring' one encouraged. Give a man the opportunity to cover his overhead and earn a fair profit and he will be enthusiastic to build his business, but when a man is losing money or barely eking out a living and always having to fight for what little he gets, he hasn't much desire to push ahead or do constructive selling. . . . When the industry as a unit talks to the public only of quality, efficiency and adequacy of installations and electrical service, the increase of wiring which we are seeking will come, and a greater use of electrical appliances and energy will result."

* Calculated from Mr. Kirkham's figures, which are percentages on sales.

L.C.C. Tramcar Seized for Debt.

Last week the Hackney Borough Council issued a distress warrant against the London County Council in respect of a debt of £714 for rates due on local premises belonging to the L.C.C. Armed with the warrant, a bailiff proceeded to the Camberwell New Road tramway depôt, boarded one of the cars and "attached" it by fastening a notice on it.

Shortly afterwards the car was released by the intervention of an official, who deposited a bond for the amount at the Lambeth County Court, and promised to bring an action in the High Court within fourteen days. *Quis custodiet ipsos custodes?*

Wireless Export Trade.

An Examination of some Typical Markets.

By A. J. S.

A SURVEY of the wireless markets of the world for the past few years will show that competition in overseas markets is mainly between the United States, Germany, and Great Britain, the total wireless exports of these countries having amounted last year to £1,813,300, £1,581,800, and £1,266,384 respectively. The principal markets of the United States are on the American continent and in Asia, those of Germany are mainly in Europe, and British wireless exports are divided in approximately equal proportions between British possessions and foreign countries.

The following figures are intended to serve as an index to the position in some of the chief wireless markets. German figures are only quoted since the stabilisation of the currency, and in the case of the exports for 1926, the value has been calculated from the total weight, which was the only quantity available at the time these notes were written.

Europe.—In most countries in Europe, German wireless supplies predominate, though judging from the position won by British goods both in Holland and Spain, it is probable that our share could be very much larger given more effective sales development work.

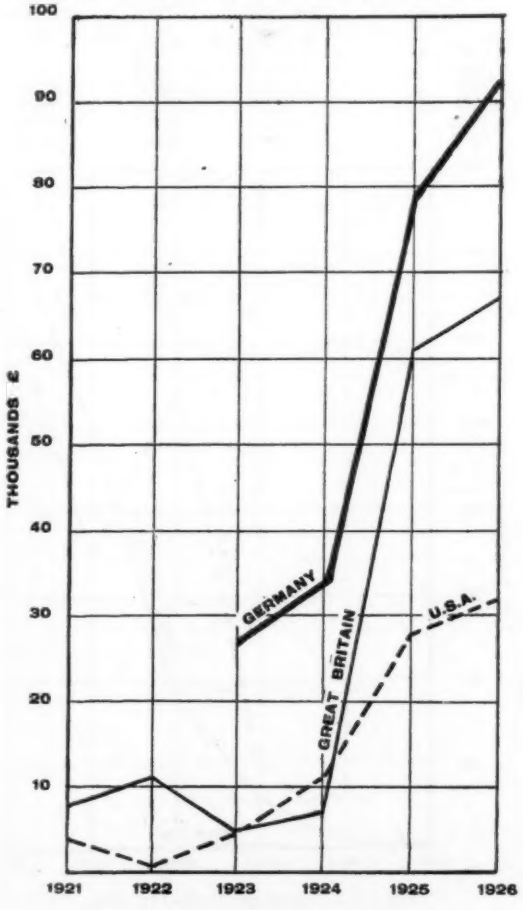


Fig. 1.—Netherlands Radio Imports.

	Gt. Britain. £	U.S.A. £	Germany. £
1921	8,608	4,000	—
1922	11,541	910	—
1923	4,933	4,919	27,500
1924	7,154	11,064	33,900
1925	61,033	28,597	79,650
1926	67,322	31,980	92,700

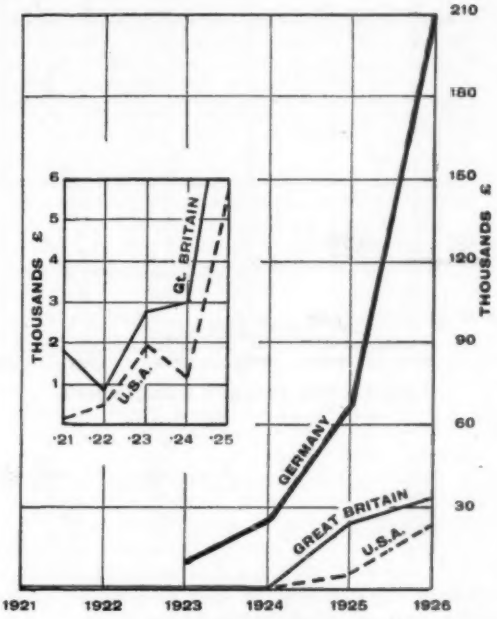


Fig. 2.—Danish Radio Imports.

	Gt. Britain. £	U.S.A. £	Germany. £
1921 . ..	1,897	294	—
1922	993	499	—
1923	2,827	1,965	9,900
1924	3,016	1,295	26,200
1925	25,457	5,844	68,000
1926	33,157	23,378	210,800

Africa.—Wireless markets in Africa are so far comparatively unimportant, and in such trade as has been done, Great Britain has held the largest share. The main market is British South Africa.

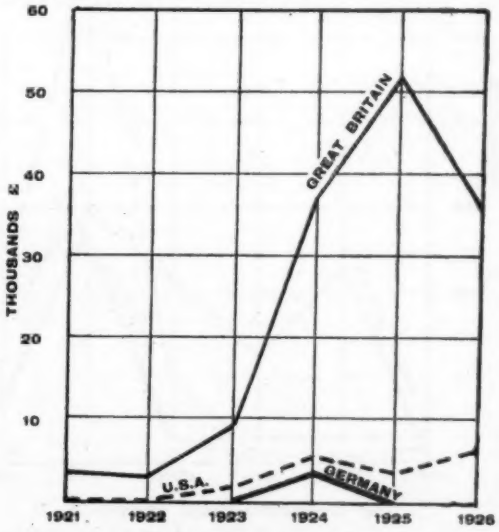


Fig. 3.—South Africa's Radio Imports.

	Gt. Britain. £	U.S.A. £	Germany. £
1921	3,111	750	—
1922	2,907	260	—
1923	8,888	1,896	100
1924	37,182	5,752	3,900
1925	52,109	4,190	—
1926	36,416	6,261	—

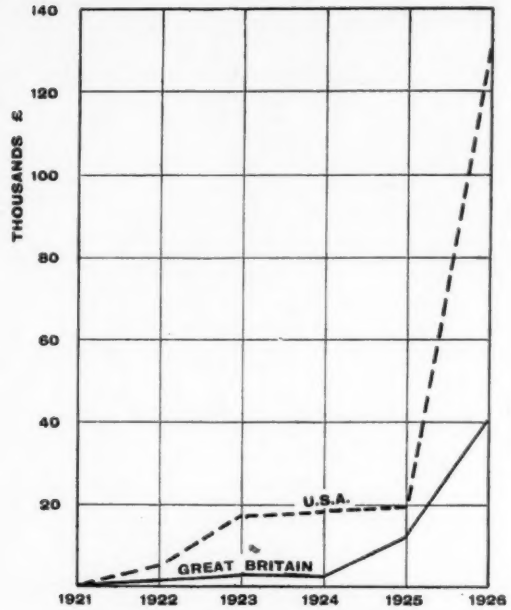


Fig. 4.—New Zealand's Radio Imports.

	Gt. Britain. £	U.S.A. £
1921	816	943
1922	1,793	5,959
1923	3,568	17,201
1924	3,446	18,183
1925	12,776	20,260
1926	40,505	129,324

Taking the continent of Asia as a whole, American wireless exports exceed British by about one-third. The most important market is Japan, where the position is as follows:—

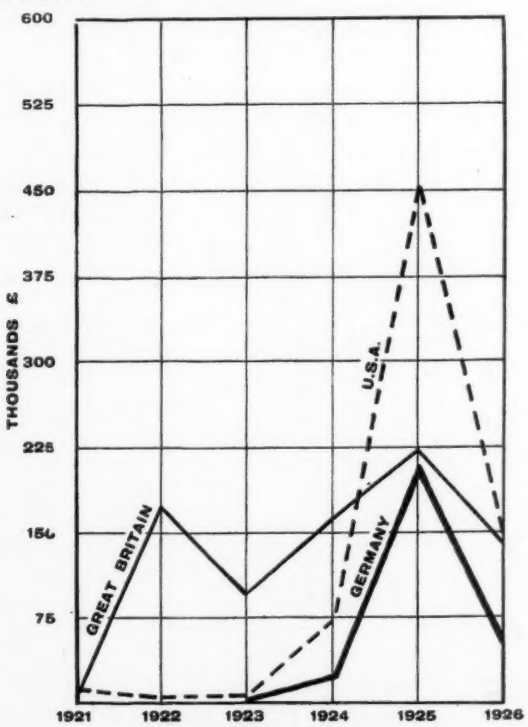


Fig. 5.—Japan's Radio Imports.

	Gt. Britain. £	U.S.A. £	Germany. £
1921	9,502	12,272	—
1922	173,603	8,585	—
1923	98,639	9,435	4,950
1924	164,648	73,860	23,000
1925	222,580	457,017	206,900
1926	139,829	147,802	50,610

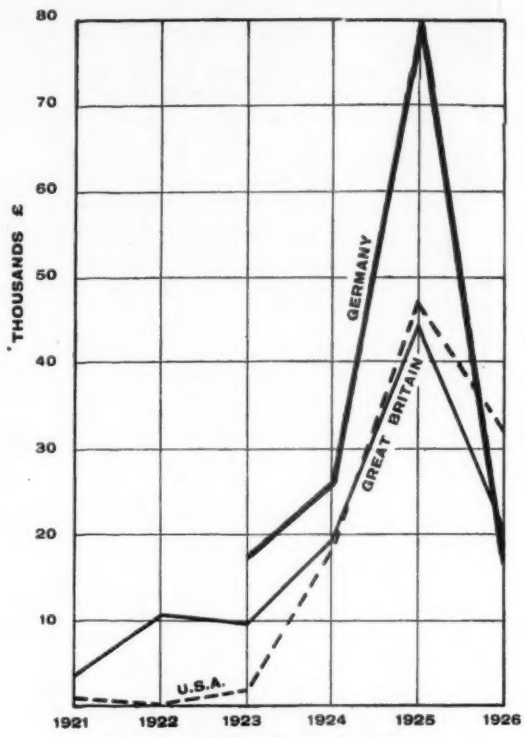


Fig. 6.—Spain's Radio Imports.

	Gt. Britain. £	U.S.A. £	Germany. £
1921	3,730	855	—
1922	10,729	135	—
1923	9,719	2,000	17,750
1924	19,125	18,855	26,200
1925	44,508	47,477	79,750
1926	21,064	32,025	16,435

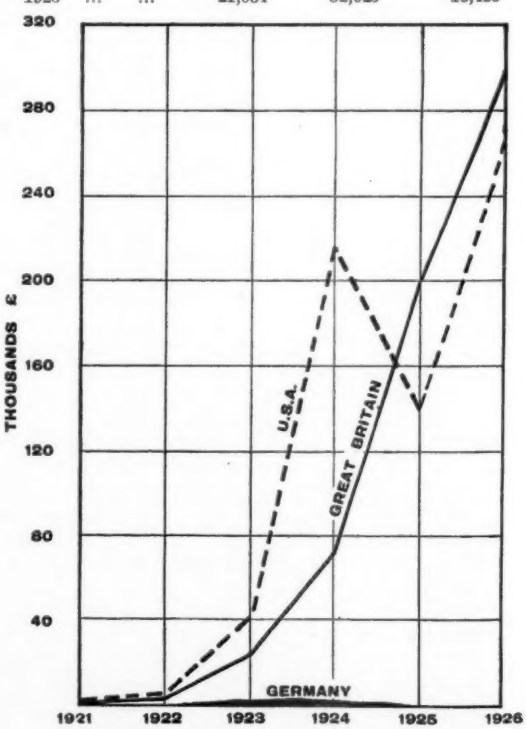


Fig. 7.—Australian Radio Imports.

	Gt. Britain. £	U.S.A. £	Germany. £
1921	2,525	2,650	—
1922	2,317	5,215	—
1923	22,698	43,345	100
1924	74,355	217,053	4,400
1925	200,132	139,274	—
1926	297,357	268,986	—

America.—Outside the United States, the most important wireless market in America is Canada, and the position there may be summarised by the statement that the United States in 1926 exported goods to a value of £595,487 against a British total of £29,357. In the case of the countries comprised in Latin America, the U.S. shipments exceed the British by about 33⅓ per cent., although in South America, both British and German exports are steadily growing.

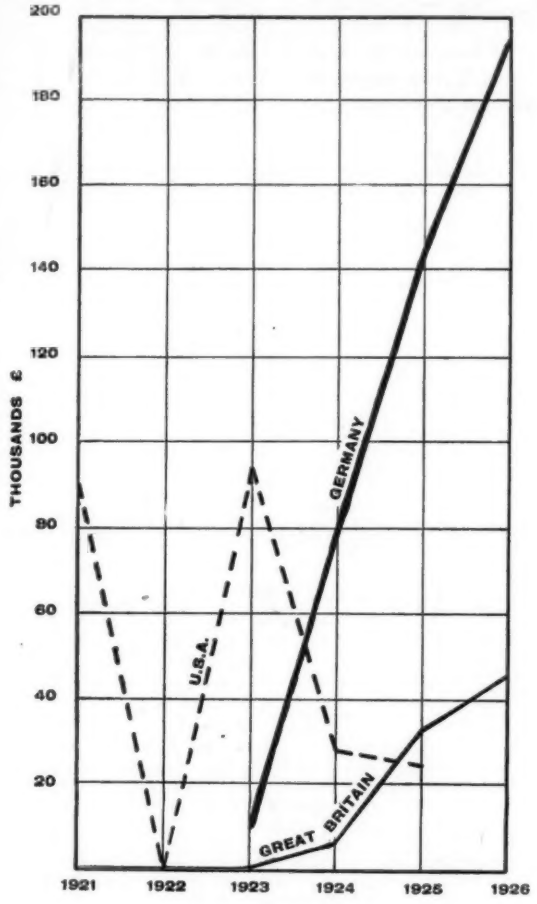


Fig. 8.—Sweden's Radio Imports.

	Gt. Britain. £	U.S.A. £	Germany. £
1921	498	90,863	—
1922	274	360	—
1923	2,383	94,615	9,250
1924	7,202	27,203	80,350
1925	33,209	25,247	146,900
1926	46,084	11,640	195,200

Australasia.—In the Commonwealth of Australia, where for the first few years of the trade American wireless goods held the first place, the position has now been reversed, and British exports have gained the leading position. German and French exports are both comparatively unimportant.

The E.D.A. Circle Campaign.

AS we have already intimated, the successful campaign of 1926-27 organised by the British Electrical Development Association (jointly with the Electric Lamp Manufacturers' Association) is to be followed up by another intensive "drive," from October, 1927, to March, 1928. The ground has already been broken up, in that the Circles which were formed during the last campaign are still in existence and the activities of the coming season will form around these local nuclei.

There are 123 of these Circles, and it is hoped to form more in such districts as are not already served, but where this cannot be done supply undertakings and electrical traders will be asked to co-operate directly with E.D.A. In addition to this the arrangements are such that every individual in the industry will be able to contribute something to the success of the campaign by a small extension of his or her regular work. National advertising will again be a feature of the scheme, but more reliance is to be placed on the Circles for the selection of newspapers, dates, and matter in their local advertising.

The objects of the campaign are to speed up domestic connections, to educate the public in the uses of electricity, to create a demand for appliances, to make all domestic connections as remunerative as possible, to facilitate applications for supply, and to concentrate on small applications only where mains and charges do not at present encourage the use of electricity for all purposes. It will thus benefit manufacturers, traders, contractors, supply authorities and the public. A special slogan has been adopted for constant use during the campaign: "For Health's Sake—Use Electricity!"

The Association stresses the fact that it is not appealing for extra funds for these additional activities: it calls for work from all those who are interested—"100 per cent. weight in the effort."

The details of the scheme are set out in a progressive series of seven pamphlets, each containing a working programme for one phase of the campaign and a registration form. No. 1 deals with National Electrical Advertising, and in this the local Circles are asked to inform the Association of the best newspapers for the purpose in their districts and the most suitable dates. A series of 26 advertisements is being produced, and examples of these will be placed before the Circles to obtain their opinions as to the most suitable 13 for their respective districts; these will embrace all the domestic uses of electricity, and will be in two main sections covering the smaller and larger uses. Other special advertisements are being inserted in home journals and architects' and builders' papers, and a number of lessons in electricity will appear in an educational weekly.

Pamphlet No. 2 prescribes arrangements for the organisation of "C.E.D.A.C." luncheons. (The initials have been chosen as a convenient name for the campaign.) These luncheons are to bring the electrical parties together and to secure the co-operation of the Press.

No. 3 is designated "Lecture Service Panels," and it states that ten lectures have been prepared (others to follow if necessary) for the use of local Circles which will arrange for good speakers to deliver them before local societies of all kinds.

A National Electric Week is to be held from December 3rd to 10th, and Programme No. 4 contains notes upon this for the aid of the Circles. It will be pre-eminently a Christmas gift week, and the suitability of electrical gifts will be urged by special advertising and shop-window displays (both provided by E.D.A.).

The fifth programme relates to Demonstration Electric Houses. In this matter the organisers have the advantage of the experience already gained. There is no doubt that this was the most attractive feature of the whole of the previous campaign, not excluding the ballot, and it is the most fruitful form of publicity.

The next pamphlet (No. 6) suggests a National Domestic Canvass to be undertaken by individual undertakings and firms; the object is to get a personal electrical message to as many householders as possible.

The last pamphlet (No. 7) deals with Direct Mail Publicity by individual firms and undertakings. The E.D.A. states that during its last effort directed to a mailing list of 10,000 names, more than 40 per cent. actually replied. Special booklets and folders of an attractive nature are being prepared.

In addition to printed publications, a selection of seasonable circular letters will be dispatched to all campaign supporters from time to time.

Business and Industrial Notes.

The Week's Electrical Trade News from all Sources. Commercial and Industrial Developments, Business Changes, Market Prices for Materials, Trade Openings, New Publicity Literature, Liquidations and Failures.

Brown, Boveri Patent Rights in Great Britain.

It is reported that an agreement has been concluded between Messrs. Richardsons, Westgarth & Co., Ltd., and Messrs. Brown, Boveri & Co., of Baden, Switzerland, by which the former secures the exclusive right to manufacture in Great Britain and Ireland steam turbines, electric generators, &c., under the Brown, Boveri patents.

British Contracts in Poland.

Reuter (Warsaw) reports that a large British firm of contractors has practically terminated negotiations for the carrying out of various public works in several provincial cities of Poland, the amount involved being about £800,000. The work will be supervised by British engineering experts, and the machinery required will be of British make.

A Visit to the Osram Works.

On July 13th, the branch managers of Cryselco, Ltd., lamp manufacturers, visited the Osram Works at Hammersmith

Cryselco Men at Hammersmith.

to see "Osram" valves being made. The accompanying photograph shows the party at the entrance to the works.

King Fuad at Trafford Park.

On July 21st King Fuad of Egypt visited the Trafford Park works of the Metropolitan-Vickers Electrical Co., Ltd., as part of his official visit to Manchester. The King was accompanied by his personal attendants, the Lord Mayor of Manchester (Alderman J. S. Swales) and other civic officials. The party was received by Sir Philip Nash, chairman of the company, and Captain R. S. Hilton, deputy-chairman. Other directors of the company and members of the Management Committee having been presented, his Majesty signed the visitors' book, and the party was then conducted round part of the works, and noted with considerable interest the amount of electrical equipment of practically every kind which is being manufactured, including much equipment for the textile industry which forms so important a link between this country and Egypt. The products seen in the course of manufacture included steam turbines and electrical generators up to 60,000 h.p., electric locomotives, transformers, switchboards, motors and control gear in a wide range of sizes. Destination names shown against the various items included practically every country in the world. In the company's sub-station special attention was drawn to a 1,000-kW rotary convertor set equipped with the company's automatic starting and control gear. A large number of automatic sub-stations have been equipped by the company with this type of apparatus. Another exhibit of special interest was a large and highly complex machine for the manufacture of glass bottles. Each machine is capable of making 5,000 bottles an hour, of 10 different sizes. The construction of such machines has not, it is stated, previously been undertaken in this country. A selection of "Cosmos" products, including electric lamps, lighting fittings, fans, cookers, and other domestic appliances manufactured in the company's subsidiary works, was displayed on a stand, which was inspected on the completion of the works tour.

The King of Egypt at the "Metrovick" Works.

New Bulgarian Company.

The Bulgarian "Telegraphia" Co., the constituent general meeting of which was recently held in Sofia, and which will manufacture telegraph and telephone apparatus, has a capital of 5,000,000 leva (about £8,000 at current exchange). Half of this has been subscribed by the Bulgarian Government, 10 per cent. by private shareholders, and the remaining 40 per cent. by the Czecho-Slovakian "Telegraphia" Co., of Prague.

"Service Cut-out Talks."

A booklet of convenient size for the pocket, bearing the above title, has been produced by W. T. HENLEY'S TELEGRAPH WORKS CO., LTD. There are eighteen "talks," each dealing with some portion of or point regarding the "Isco" series of service cut-outs, *e.g.*, temperature rise, self-aligning contacts, "short" talks, surface leakage, &c. It is of interest to know that all but one of these talks have appeared in the advertisement columns of the ELECTRICAL REVIEW, a series of them having secured a prize in our last Advertisement Competition.

Local Exhibitions.

HASTINGS.—During the recent Health Week an exhibition was held, in which the Corporation Electricity Department had a four-roomed stand displaying electrical fittings and appliances. The stand was awarded a silver medal for the hygienic value of the appliances. The latter were supplied by the General Electric Co., Ltd.

WILLESDEN.—The Council Electricity Department is running an exhibition of "Magnet" domestic appliances at its Salusbury Road showrooms until to-morrow (Saturday). During the exhibition lectures and demonstrations have been given by competent operators.

The Russian Electrical Trust.

It is reported that the Soviet Electrical Trust is to be converted into a company with a share capital of 5,500,000 roubles, in which foreign capital is to participate to the extent of 49 per cent. The foreign share is to be provided in the form of machinery and apparatus for the extension of the work of electrification in Russia.

Engineering Employés' Wages.

The result of the ballot of the engineering trade unions upon the offer by the Engineering and Allied Employers' Federation of 2s. per week extra to plain time workers was announced last week. The figures were as follows:—For acceptance, 81,575; against, 41,527; majority in favour, 40,048. It is stated that the increase will affect 165,000 men employed by "federated" concerns, in addition to numerous others. The Amalgamated Engineering Union is the body principally concerned, but a number of other trade unions, including the Electrical Trades Union, are also involved to some extent. The increase is to be put into force almost immediately.

A Marketing Intelligence Index.

A semi-monthly "Marketing Intelligence Index" is being issued under the direction of Mr. E. T. Elbourne, A.M.I.Mech.E. The scope of the publication is defined as "intelligence or information bearing on markets, and on policy, principles, and methods of marketing." Arrangements are being made with trade associations and other bodies and the index will deal with official reports and statistics, periodical publications and year books, and books and pamphlets. There will be commodity and subject codes; one of the main headings of the former will be electrical engineering and manufactures.

Recent Contracts.

JOHN THOMPSON WATER TUBE BOILERS, LTD., have received a contract for a vertical straight-tube "Alpha" type water-tube boiler, complete with steam and water fittings, suitable for a working pressure of 190 lb. per sq. inch, together with superheater and special firegrate for burning wattle logs, sawdust and waste chippings, for the Greytown (S.A.) municipality.

The lighting of the new May Fair Hotel, W.1, has been carried out by MESSRS. V. G. MIDDLETON & CO., LTD. Ten thousand "Osram" lamps have been used for the work as well as numerous other products of the General Electric Co., Ltd. A prominent feature of the installation is the use of specially-designed glass-mirrored cornice reflector, upwards of two thousand feet having been employed for the bases of the domes and the ceilings. With this are used 20-W sign-type lamps spaced 4 in. apart. Concealed lighting is installed in the ballroom, and this is supplemented by six G.E.C. floodlights. In the garden grill and lounge the effect of noonday sunshine, twilight or moonshine is obtained by means of gas-filled lamps provided with coloured screens. In other parts of the buildings specially-designed fittings have been installed.

New Australian Company.

The National Electrical Engineering Co., Ltd., has been registered in Sydney, with a capital of £25,000, to carry on an engineering and electrical business.

Unemployment during June.

The July *Ministry of Labour Gazette* reports that employment in the engineering industry during June continued slack on the whole, but showed a further slight improvement, except in the Midlands, where there was a seasonal decline in the motor and cycle section. Employment in the electrical engineering branch remained fairly good. The overall percentage of unemployed in the engineering industry fell from 8.7 to 8.5 per cent.; in the electrical engineering branch the decline was from 5.1 to 4.7 per cent. There was a distinct improvement in the electrical wiring and contracting industry following a big increase of unemployment in May; the unemployment proportion fell from 9.1 to 7.0 per cent. In the electric cable, wire and lamp manufacturing group, on the other hand, there was a slight rise in unemployment—from 7.4 to 7.5 per cent. The actual numbers of unemployed as at June 20th were as follows:—Engineering, 85,037; electrical engineering, 3,628; electrical wiring and contracting, 969; electric cable, wire and lamp manufacturing, 6,556.

Social Events.

The Hugo Hirst Cricket Challenge Cup, presented for competition by the various London sections of the G.E.C., has been won by the G.E.C. Union Works, Wembley, which, in a low-scoring match, defeated Watson's by 116 runs to 42.

Over 100 employés of Power Contracts, Ltd., participated in the annual outing of the firm on July 16th. This took the form of a river trip as on all former occasions. The boat was joined at Staines and proceeded to Windsor, where guides conducted the party round Windsor Castle. Luncheon was provided at the Bridge House Hotel, Windsor. The party re-embarked and proceeded to Marlow, returning to Staines at about 9 p.m.

The lease of the sports ground used by the "Evignes" Social and Athletic Association having expired, Messrs. Evershed & Vignoles, Ltd., recently acquired the freehold of a field of several acres situate at Boston Manor in pleasant surroundings. The ground was inaugurated on July 16th by a very successful sports meeting attended by the managing directors, Messrs. E. B. Vignoles and A. Vines, and a numerous company. The programme was carried through without a hitch and well up to time, while music was provided by the "Evignes" Orchestra. Some very close finishes were seen and the "Dorothea" challenge cup, for the department scoring most points, was secured by the Milling Department. The prizes were presented by Mrs. A. Vines, after which there was dancing on the lawn.

German Imports into New South Wales.

During the month of March last cable and wire of German manufacture, valued at £1,561, was imported into New South Wales; £1,424 worth of electrical appliances; and £3,098 worth of vacuum cleaners.

Polish Foreign Electrical Trade.

Poland imported apparatus, conductors, and other electro-technical materials, valued at 3,879,000 gold zloty (£155,000) during May last, and exported such goods to the value of 37,000 zloty (£1,480).

Trade Announcements.

The sales, publicity, and commercial departments of the ASSOCIATED DAIMLER CO., LTD., other than design and experimental, will be removing to new offices at Windmill Lane, Southall, Middlesex, as from August 8th. Telegraphic address: "Vangastow Southall"; temporary telephone number: Southall 1502.

Mr. T. FAGIN, wireless dealer, 60, Union Street, Aldershot, having disposed of his lease, is realising his stock by a special sale.

MESSRS. ENGLAND, VICARY & CO. have changed the address of their Manchester office to Orme Buildings, Parsonage, Manchester. Telephone: City 1544. Their Manchester manager is Mr. E. L. Batson-James.

MR. H. C. SIMPSON, A.M.I.Mech.E., has been appointed as technical sales representative in London and the South of England for Electricars, Ltd. Mr. Simpson has been closely associated with road transport and the electric vehicle industry for many years. He brings to his appointment considerable knowledge of mechanical transport problems, one of his interesting experiences having been the introduction of the first heavy mechanical transport units into Abyssinia on behalf of the Abyssinian Government.

BRITISH B.A.G., LTD., 23, Farringdon Avenue, London, E.C.4, has been appointed sole distributor in Great Britain and Ireland for the heating and cooking apparatus manufactured by Messrs. Maxim, of Aarau, Switzerland. Stocks will be held in London.

The Manchester offices of the MARCONIPHONE CO., LTD., AND REDUCED, are now at 10, Dolefield, Manchester. Tel.: Manchester City 1488 and 7035.

SILVERTOWN LUBRICANTS, LTD., has opened an office at Norway House, Cockspur Street, S.W.

MR. WILFRED ORMEROD, electrical engineer and contractor, has removed to 22, Burnley Road, Todmorden.

New Catalogues and Lists.

Messrs. WOOTTON & CO., LTD., High Street, Ponder's End, Middlesex.—A mailing card advertising the company's sunk switch boxes in standard cartons.

The QUEEN'S ENGINEERING CO., 60, Queen's Road, Battersea, S.W.8.—Leaflet D.C.S., containing particulars and prices of d.c. dynamos, small motor-generators, battery chargers, &c.

KENT BROS. ELECTRIC WIRE CO., and E. H. PHILLIPS, LTD., Kew Works, Mortlake Road, Kew Gardens, Surrey.—A brochure produced on the occasion of the company's removal to its new factory. It contains a number of illustrations of the Kew premises, showing the excellent manufacturing facilities which exist there, in addition to notes upon the company's products. The cover is effective and ingenious.

The MARCONIPHONE CO., LTD., 210-212, Tottenham Court Road, W.C.2.—Publications No. 486, containing particulars and prices of the "Model 32" three-valve receiver; No. 457B, dealing with "Marconiphone" power units for a.c. and d.c. mains; and No. 459, an instruction booklet for users of the "Model A.C.2" h.t. supply unit. Also a booklet containing illustrated instructions for operating the "Model 32" receiver

Sir W. H. BAILEY & CO., LTD., Albion Works, Salford.—Pamphlet No. 1727, illustrating and describing a single-lever deadweight machine for tensile, transverse, and crushing tests to 10 tons.

The HART ACCUMULATOR CO., LTD., Marshgate Lane, Stratford, E.15.—A double-crown poster advertising "Hart" wireless batteries, depicting a summer garden scene. Also a 20 in. by 15 in. showcard bearing the same design.

The CONCORDIA ELECTRIC WIRE CO., LTD., New Sawley, near Nottingham.—Three price lists, dealing respectively with the company's silk-covered, enamelled-copper, and high-resistance wires.

MESSRS. W. B. TREW & SONS, Kingsbury, N.W.9.—Leaflets advertising the company's high-frequency apparatus. Illustrated and priced.

MESSRS. WARD & GOLDSTONE, LTD., Frederick Road, Pendleton, Manchester.—An illustrated and priced folder describing "Negrolac" aerial wire for indoor and outdoor service, together with a sample.

MESSRS. L. ANDREW & CO., 2, Whitworth Street West, Deansgate, Manchester.—Net price lists of cables and insulating materials.

MESSRS. JOSEPH ADAMSON & CO., P.O. Box 4, Hyde, Cheshire.—An illustrated brochure dealing with the company's waste-heat boilers and depicting actual installations.

THE CENTURY ELECTRIC CO., 1806, Pine Street, St. Louis, Mo., U.S.A.—A folder (No. 652) illustrating the construction of the company's single-phase repulsion-start induction motors.

Bankruptcy Proceedings.

S. C. RAPSON, C. L. BURRILL, and A. J. HEFFER, trading as the Suburban Electrical and Maintenance Co., 2, Plough Yard, Shoreditch, E.—The failure of this firm occurred on May 25th, and an application for discharge was made on July 19th to Mr. Registrar Mellor at the London Bankruptcy Court on behalf of the partners Burrill and Heffer. Mr. V. Armstrong, Assistant Official Receiver, reported that the provable debts amounted to £2,813; the assets, valued at £718, had realised £523, and a first and final dividend of 2s. 10½d. in the £ had been paid. The application was opposed by the Official Receiver on the grounds (1) insufficiency of assets to equal 10s. in the £ on the amount of the liabilities; (2) omission to keep proper books of account; and (3) trading with knowledge of insolvency. His Honour granted the two bankrupts a discharge subject to a judgment for £25, to be satisfied by an immediate cash payment.

JOSEPHINE R. HEREFORD and VIOLET DE FRECE, trading as the Radio Cash Stores, 371, Upper Street, Islington.—An application arising out of this failure came before Mr. Justice Clauson, sitting on July 20th as bankruptcy judge in the Chancery Division. Mr. Tindale Davis, on behalf of the trustee, asked for a declaration that a sum of £272 in his hands was part of the bankrupt's estate, and was divisible among the creditors. The money came into the hands of the trustee by way of deposit on the purchase by a Miss Wolfe of some property of Mrs. Violet de Frece. The purchase was not completed by Miss Wolfe, but the property was sold privately by the trustee to another party in June, 1926, at an enhanced price of £30. The contention of the trustee was that the deposit had been forfeited by Miss Wolfe, and that the sum of £272 formed a part of the bankrupt's estate. Mr. Oscar Kean, on behalf of Miss Wolfe, submitted that there had been no effective forfeiture of the deposit, and that Miss Wolfe had given no authority for any undertaking for the purchase to be completed within a specified time. His Lordship thought that the trustee was within his right in treating the deposit as forfeited, and was entitled to a declaration that the amount in question formed part of the bankrupt's estate. He directed the trustee to take his costs out of the estate.

H. FLETCHER (Western (Bolton) Lighting & Power Co.), electrical engineer, 17a, Burlington Street, Bolton.—Receiving order made July 14th, on debtor's own petition.

D. ROSCOE, mechanical and electrical engineer, 4, North Albion Street, Fleetwood.—First meeting held July 28th, at the Official Receiver's offices, 11, Winckley Square, Preston. Public examination, September 16th, at the Court House, Blackpool.

G. BLADES, electrical engineer, 55, Hainton Avenue; and 52, Pasture Street, Great Grimsby.—First meeting held July 28th, at the Official Receiver's office, St. Mary's Chambers, Great Grimsby. Public examination, August 4th, at the Town Hall, Great Grimsby.

J. TURNER, electrician, 62, Blackburn Road, Great Harwood.—Last day for proofs for dividend, August 6th. Trustee, Mr. J. P. Duxbury, 27, Richmond Terrace, Blackburn.

H. ROBINSON, electrician, wireless dealer, &c., 41, Wigan Lane, Wigan.—First and final dividend of 4s. 11½d. in the £, payable at the Official Receiver's offices, 11, Dale Street, Liverpool.

A. E. HUMPHREYS, electrical engineer, 20, St. James Square, S.W.—Receiving order made July 20th, on a creditor's petition. First meeting, August 4th; public examination, September 27th, both at Carey Street, W.C.

J. EADE (J. Eade & Son), electrical contractor, 48, New Road, Skewen, Glam.—Trustee, Mr. W. G. Board, 23, Wind Street, Swansea, appointed July, 1927.

H. HALL, wireless dealer, 26, Egerton Street, Radcliffe, Lancaster.—Trustee, Mr. J. G. Gibson, Official Receiver, Byrom Street, Manchester, released July 15th.

J. A. A. BARDSLEY, electrical contractor, 91, Old Hall Lane, Withington, Manchester.—Trustee, Mr. J. G. Gibson, Official Receiver, Byrom Street, Manchester, released July 15th.

J. A. M. JAMES (Fuchsiaphones Installations), wireless dealer, 9 and 11, Mill Street, Middleton, Lancaster.—Last day for proofs for dividend August 6th. Trustee, Mr. F. Murgatroyd, Official Receiver, Byrom Street, Manchester.

Company Liquidations.

FRANK THORNTON, LTD., electrical and wireless engineers, 1, Parker Lane, Burnley.—A meeting of creditors was held recently at Manchester, when the liquidator, Mr. J. P. Wood, stated that in consequence of the company being served with a large number of writs and summonses, resolutions for voluntary liquidation had been passed on June 29th last. The liquidator submitted a statement of affairs which disclosed liabilities of £6,322, and net assets of £1,068, leaving a deficiency as regarded the creditors of £5,254. The issued capital of the company was £5,897, so that there was a total deficiency as regarded contributories of £11,151. The bank and the Burnley Corporation were partly secured creditors. The company was registered on February 3rd, 1926, with a nominal capital of £6,000. At that time it was stated that there was an excess of assets over liabilities of £2,416, which included £950 for goodwill, £300 for patents, &c. The purchase price was £2,250, which was satisfied by the issue of vendors' shares and £166 in cash, which amount had apparently never been paid. Subsequently £200 was written off the goodwill account and charged to the vendors, making the goodwill £750. Further sums were also obtained totalling £3,647 for shares. The company bought premises in Cannon Street, Burnley, paying £3,094 for the buildings and £750 for the machinery. An overdraft was obtained at the bank, the latter taking a mortgage on the property. The venture, however, was not a success, and was closed in April last, a considerable loss being sustained. Accounts for the twelve months to July 31st, 1926, disclosed a loss of £981. The present position was attributed to heavy overhead charges. It was decided to confirm the voluntary liquidation of the company with Mr. Wood as liquidator. An advisory committee was appointed consisting of Mr. Hamilton (Edison Swan Electric Co., Ltd.), the representative of the bank, and Mr. A. T. Eaves. The principal creditors are:—

	£		£
Baxendale & Co., Ltd. ...	159	Marconi Wireless Co. ...	100
Anglo-American Oil Co.	115	Edison Swan Electric Co., Ltd.	108
Samuel Gratrix, Jun., and Bro., Ltd.	154	Cunliffe, A. R.	86

AVALITE, LTD., wholesale electrical and wireless engineers, 16, Bridge Street, Burnley.—A meeting of the creditors of the above was held recently at Manchester, when a statement of affairs was submitted by the liquidator, Mr. J. P. Wood. The statement disclosed liabilities of £3,547 and net assets of £1,547, leaving a deficiency as regarded the creditors of £1,999. The issued capital of the company was £5,897, so that there was a total deficiency of £7,896. The company was registered in February, 1926, with a nominal capital of £5,000; £2,210 in preference shares and £3,687 in ordinary shares had been issued. At the date of the formation of the company there was an excess of assets over liabilities of £2,415, but that included such items as £950 for goodwill. The purchase price was made up of 2,250 shares issued to the vendors and cash to the extent of £165 14s. 3d. Apparently, however, the cash had not been paid, and subsequently £200 of the goodwill was written off and debited to the vendors. Accounts were prepared for the year to July 31st, 1926, which disclosed a loss. The company had been served with several writs, and there was a distraint for rent. In consequence resolutions were passed for voluntary liquidation on June 29th last. The present position was stated to be principally due to the heavy overhead charges. It was decided to confirm the voluntary liquidation of the company with Mr. Wood as liquidator, while an advisory committee was appointed consisting of Mr. E. G. Moore (Messrs. Probet & Co.), and Mr. A. T. Eaves. The following are creditors:—

	£		£
Probet & Co.	640	Smith, J. & W. B., Ltd.	100
Scott Insulated Wire Co.	285	Enfield Cable Works ...	99
Dyson, J.	272	Cunliffe, A. R.	86
Nathan, F. J.	210	Siemens-Schuckert ...	79
Metropolitan - Vickers Co.	180	Mercer & Park, Ltd. ...	77
St. Helens Cable and Rubber Co., Ltd. ...	116	Trefileries Lamineries ...	63
		Benjamin Electric, Ltd.	59

ORION ENGINEERING CO., LTD., electrical engineers, &c., Standard Buildings, Leeds.—The statutory meeting of creditors was held recently at the offices of the liquidator, Mr. W. A. Holmes, 28, East Parade, Leeds. The statement of affairs presented showed liabilities of £2,908, and the assets, after allowing £3 for preferential claims, were estimated to realise £1,084, leaving a deficiency of £1,824. The company was registered in 1924, with a nominal capital of £10,000, and was formed for the purpose of manufacturing dynamos for houses, and engines. The issued capital consisted of 2,002 ordinary and 3,950 preference shares, all of which were fully paid. One of the directors was a cash creditor for £2,200, but it was stated that he proposed to withdraw his claim. The company had traded at a loss. Negotiations were in progress for the sale of the stock and other assets at a figure which it was thought would allow the creditors to receive payment in full. The creditors decided to confirm the voluntary liquidation of the company with Mr. Holmes as liquidator.

ROBINSON & HANDS ELECTRICAL CO., LTD., Barwick Street, Birmingham.—A meeting of creditors was held on July 21st, at the Chamber of Commerce, Birmingham, when the chair was occupied by the representative of Callender's Cable and Construction Co., Ltd. Mr. G. W. Sparrow, Newhall Street, Birmingham, one of the liquidators appointed in the voluntary liquidation of the company, submitted a statement of affairs which disclosed liabilities of £27,510, and net assets of £20,906, leaving a deficiency as regarded the creditors of £6,604. The issued capital amounted to £12,114, so that there was a total deficiency as regarded contributories of £18,718. The company was incorporated in November, 1908, with a nominal capital of £1,000, which was subsequently increased to £20,000, divided into £1 shares, of which 12,114 had been issued for cash. The bank was a secured creditor; it was collaterally secured by the directors, and in addition it held a charge upon a private house and a portion of the machinery. There was a claim by A. C. Robinson for £520 in respect of undrawn salary. At December 31st last there was a deficiency of £4,418. The difference between that figure and the deficiency shown in the statement

of affairs was accounted for by depreciation and a loss of £2,296, which had been sustained on the trading since December last. Recently a number of creditors commenced to press, and resolutions were passed for voluntary liquidation. It was resolved that the voluntary liquidation of the company should be confirmed with Messrs. Sparrow and F. E. Bendall, of Messrs. Poppleton & Appleby, Birmingham, as joint liquidators. A committee was also nominated consisting of Mr. Brotherton (British Insulated Cables, Ltd.), Mr. Robson (General Electric Co., Ltd.), Mr. A. W. Welton (Mullard Wireless Service Co., Ltd.), Mr. Gunnell (Foster Engineering Co., Ltd.), and Mr. A. Cripwell (representing creditors). It was intimated that efforts would be made to formulate a scheme for dealing with the liabilities or to dispose of the business in the best interests of the creditors. The following are creditors :—

	£		£
Benjamin Electric, Ltd.	53	Jung Bauer	62
British Insulated Cables, Ltd.	3,523	Kenrick & Jefferson, Ltd.	50
British Thomson-Houston Co., Ltd.... ...	597	Kersons Manufacturing Co., Ltd.	245
Bell, J. C., & Co., Ltd.	99	Keatley, J., Ltd. ...	61
Bayliss, Marsh & Newey, Ltd.	55	London Electric Wire Co., & Smiths, Ltd.	190
Brush Electrical Engineering Co., Ltd. ...	556	Longmore Bros. ...	83
Callender's Cable and Construction Co., Ltd.	2,123	Metro-Vick Supplies, Ltd.	70
Cable Accessories Co., Ltd.	94	Midland Electric Manufacturing Co., Ltd. ...	244
Crabtree, J. A., & Co., Ltd.	269	M.K. Electric, Ltd. ...	71
Central Manufacturing Co., Ltd.	109	Mullard Wireless Service Co., Ltd. ...	458
Chloride Electrical Storage Co., Ltd. ...	176	Marconiphone Co., Ltd.	230
Cossor, A. C., Ltd. ...	325	Measurement, Ltd. ...	52
Clayton Rubber Co., Ltd.	82	Marples, E., Ltd. ...	99
Celestion Radio Co. ...	81	Macintosh Cable Co., Ltd.	164
De-Garrs & Allen, Ltd.	55	Northern Electric Wire Co., Ltd.	89
Ellis, G., & Son ...	50	National Gas Engine Co., Ltd.	141
Edison Swan Electric Co., Ltd.	182	N.V. Elentenfabriek ...	80
Fuller Accumulator Co. (1926), Ltd.	64	Ormond Engineering Co., Ltd.	102
Ferguson, Pailin, Ltd.	67	Philips Lamps, Ltd. ...	821
Foster Engineering Co., Ltd.	724	Quitmann, C.	155
General Electric Co., Ltd.	574	Radio Instruments, Ltd.	57
Graham Amplion, Ltd.	282	St. Helens Cable and Rubber Co., Ltd. ...	166
Garnett, Whitely & Co., Ltd.	58	Stearn Electric Co., Ltd.	89
Henley's (W. T.) Telegraph Works Co., Ltd.	413	Sparrow, Lunt & Co. ...	150
Hill, W. B., Shorter and Co.	59	Siemens Bros. & Co., Ltd.	154
Hunt, A. H., Ltd. ...	247	Tucker, J. H., & Co., Ltd.	65
Edison Bell, Ltd. ...	65	Veritys, Ltd.	141
		Varley Magnet Co. ...	147
		Wholesale Fittings Co., Ltd.	136
		Wilkins & Wright ...	52
		Wusisch, Carl	52

ELECTRICITY FINANCE & DISTRIBUTION CORPORATION, LTD., 121, Cheapside, E.C.—The first meetings of creditors and shareholders were held on Monday last, at Carey Street. The liquidation is a compulsory one, and some interesting evidence was given. Col. E. O. Eaton, the promoter of the company, was stated to be unfit to attend the meetings. The proceedings will be reported in our next issue.

WIRELESS WAREHOUSES, LTD.—A meeting of members is called for August 30th at the office of Mr. C. Latham, 78, New Oxford Street, W.C., to hear an account of the winding up.

MEARS EARPHONE CO. (LONDON), LTD.—Winding up voluntarily. Liquidator, Mr. E. H. Miller, 57-58, Chancery Lane, W.C. Meeting of creditors, August 5th, at the liquidator's offices. Particulars of claims by August 31st.

WIRELESS LIGHTS SYNDICATE, LTD.—Winding up voluntarily. Liquidator, Mr. W. Elles-Hill, 17, Throgmorton Avenue, E.C. Meeting of creditors, August 2nd, at the liquidator's offices.

Private Arrangements.

E. PARCELL, Eastcheap, Letchworth, wireless and electrical dealer.—In response to a circular letter issued by Messrs. J. J. Eastick & Sons, the largest unsecured creditors, a meeting of the creditors in this matter was held recently at the offices of Messrs. Corfield & Cripwell, Finsbury Pavement, E.C. Mr. Eastick said that several writs had been issued and it was decided to try and preserve the business as it was considered to be a fairly satisfactory one in normal times. As far as could be ascertained the liabilities amounted to £706, and the assets totalled £791. The debtor had interviewed friends but so far he had not been able to obtain any satisfactory results, and at the present time it was impossible to offer the creditors any composition. It was decided that a deed of assignment should be executed in favour of Mr. W. A. Osborne as trustee and that a further meeting of creditors should be called before the deed was registered. The following are creditors :—

	£		£
Brown Bros.	33	Flinders & Co.	122
Eastick, J. J., & Son ...	117	Scott, Adolph, Ltd. ...	41
Edison Swan Electric Co., Ltd.	37	Stevens, A. J.	27
		S.D.H. Mfg. Co. ...	22

D. CORMACK, trading as David Cormack & Co., 15, Lord Street, Liverpool, electrical contractor.—A meeting of creditors was held recently, at the offices of Mr. P. S. Booth, 2, Bixteth Street, Liverpool, when a statement of affairs was submitted which disclosed liabilities of £1,354, and net assets of £60, leaving a deficiency of £1,294. The debtor commenced in business in 1907, with £200 borrowed capital; the amount was later repaid. A full set of books had been kept, and the turnover had decreased from £4,792 in 1920 to £1,641 for the twelve months to March 31st last. The debtor attributed his position to that decline. The debtor put forward an offer of 1s. in the £, with the assistance of friends, but the creditors did not consider the offer adequate, and it was eventually increased to 1s. 6d. in the £, which was accepted. The following are creditors :—

	£		£
Campbell & Isherwood	20	Kempton, W. J. B. ...	70
Downes & Davies ...	316	Liverpool Corporation ...	47
Dodd & Oulton	23	Walsall Hardware Manufacturing Co., Ltd. ...	70
Electrical Supplies, Ltd.	44		

ELECTRICAL DEVICES, LTD., wireless and electrical factors, Newcastle-on-Tyne.—A meeting of creditors was held on July 20th, at Caxton House, Westminster. Mr. S. A. S. Forster, County Chambers, Marton Road, Middlesbrough, the receiver for the debenture holder, occupied the chair, and submitted a statement of affairs which showed liabilities of £4,533 and net assets of £3,326, leaving a deficiency of £1,207. The chairman stated that the debentures were held by the bank, which appointed him as receiver in May, and he had since carried on the business. The company was registered in 1921, and in its first year sustained a loss of £60. In the second year it made a profit of approximately £60, and in the succeeding 14 months a profit of £993. In the following year the profit was £340. That period of prosperity coincided with the boom in wireless apparatus. The company, thinking that there was good business to be done in the wireless trade, went in for it somewhat heavily. The original capital was £1,000, and it was increased in 1924 to £1,500, and in 1925 to £2,000. All the shares were issued for cash. In 1924 and 1925 the turnover was something like £25,000. The capital was comparatively small for such a turnover, and as there was difficulty in collecting the book-debts the company had to seek financial assistance from the bank. On paper there was a considerable surplus of assets over liabilities. The period of prosperity was followed by one of depression in the wireless trade, and that aggravated the difficulties of the company, as it carried substantial stocks and had a large number of outstanding accounts. During the year to May, 1926, there was a loss of rather more than £500, and it became increasingly evident that further capital would have to be found. Negotiations to that end were entered into, but then the coal strike occurred, and business in the Newcastle district was severely hit. The efforts made to obtain further capital fell through. The bank made advances up to £750 on the guarantee of a shareholder. Towards the end of last year the bank agreed to grant a further loan of £500, provided it was given a debenture for £1,250, which would also cover the previous advances.

Since May last year the liabilities to creditors had been substantially reduced, whilst some £6,000 worth of business had been done with suppliers. Since his appointment he had been able to very considerably reduce the losses and effect various economies. In the coming season he hoped to make the business a profitable one, and it could then either be sold as a going concern, or carried on until all the liabilities were discharged. A resolution was passed authorising the receiver to carry on the business until December 31st next, when a further meeting of creditors would be called. The principal creditors are :—

	£		£
Adair, P., Ltd.	86	Igranic Electric Co., Ltd.	74
British Thomson-Houston Co., Ltd.	53	Mullard's	79
Callender's Cable and Construction Co., Ltd.	25	Marconiphone Co., Ltd.	167
A. C. Cossor, Ltd. ...	60	Macdonald, C. A., Ltd.	80
Electric Cables, Ltd. ...	88	Pattison Accumulator ...	50
Edison Swan Cables, Ltd.	36	Radio Communication Co., Ltd.	70
Falk, Stadelmann & Co., Ltd.	40	Rothermel Radio Corporation	45
Foster Engineering Co.	630	Ripaults, Ltd.	66
Burndept, Ltd.	137	Siemens & English Electric Lamp Co., Ltd. ...	96
General Electric Co., Ltd.	38	Tapling, Thomas & Co. ...	58
Graham, A., & Co., Ltd.	95	Veritys, Ltd.	30
Hawkins, L. T.	44	Western Electric Co. ...	65
Metro - Vick Supplies, Ltd.	30	Watson's Wholesale Wireless Co.	29
		Whiteley, Boneham and Co.	35

A West Ham Poster Competition.

The West Ham Electricity Department recently organised a competition for the students of the Art School in the local Technical College for poster designs suitable for the Department's use. The judges were Mr. J. W. Beauchamp (director of E.D.A.), Mr. F. W. Purse (engineer and manager), and Mr. Neil.

A number of effective designs were received, and Miss M. E. Robinson, Forest Gate, secured the first prize with the design reproduced herewith. We are informed that the black and white reproduction does not do full justice to the design. The magician and responding elves, gnomes or devils, are in blue, the switch and light rays therefrom (an undesirable phenomenon in ordinary circumstances) are in yellow and

A Winning West Ham Poster Design.

the lettering is in red. The inscription is calculated to attract. The second prize was awarded to Mr. E. J. Davis, Plaistow, for a design symbolising lighting alone, while Mr. T. J. Fry won the third prize for a silhouette picture introducing a power station, cable drum, and homes.

Callender Cable in a Winter Garden.

The Weston-super-Mare Winter Garden Pavilion was formally opened on July 14th. A beautiful feature of the Pavilion is a rose garden and this has been wired throughout with Callender's "Ancalite" cable, by Messrs. Crowe & Green, of Weston-super-Mare. This type of cable was selected for its ability to withstand high summer temperatures, rain, sunshine, and sea-spray.

Summer Holidays.

The JACKSON ELECTRIC STOVE CO., LTD., announces that its Luton works will be closed for the whole of next week, and its Sloane Street offices from July 30th to August 3rd.

The works and offices of the CREDENDA CONDUITS CO., LTD., will be closed for stocktaking from to-day (Friday) until August 6th (both dates inclusive). A small staff will be retained for urgent correspondence.

Electric Power in Industry.

Further trades are dealt with in Preliminary Report No. 19 on the 1924 Census of Production, issued with the *Board of Trade Journal* dated July 21st. It is shown that the butter, cheese, condensed milk and margarine trades had 10,180 kW of electric generating plant in 1924, as compared with 711 kW in 1907. 18,524 h.p. of electric motors were installed, and power for 5,254 h.p. of these was purchased. The saddlery, harness, travelling bags and leather goods trades reported 573 kW of electric generators (against 348 kW in 1907). The motors installed aggregated 3,608 (power for 2,021 h.p. purchased). The umbrella and walking stick trades employed 392 kW of generating plant (against 15 kW in 1907), and the aggregate capacity of motors installed was 1,928 h.p. (power purchased for 1,351 h.p.). Electric motors were used by the artificial flower, &c., trades to the extent of 180 h.p.

French Foreign Electrical Trade.

The Assistant United States Trade Commissioner in Paris reports that French exports of electrical apparatus during 1926 amounted to 12,317 tons, valued at 408,498,000 fr., as compared with 8,786 tons (154,000,000 fr. in 1925). At the same time, the imports were 3,106 tons (143,486,000 fr.), against 4,450 tons (104,607,000 fr.). Considering values, the principal supplier during 1926 was Germany, whose share amounted to 627 tons, valued at 31,599,000 fr., against 973 tons (21,798,000 fr.) in 1925. Switzerland again supplied the largest quantity—822 tons, valued at 27,559,000 fr., but was second as regards values. The United States' share fell from 938 tons to 428 tons (26,087,000 fr. to 23,288,000 fr.), while that of Great Britain decreased in quantity from 822 to 402 tons, but rose in value from 15,056,000 fr. to 20,976,000 fr.

Electricity in Gold Mining.

The Nus River Gold Mines, Ltd., has decided to harness the San Roque Falls to provide electric power for dredging operations and pumping purposes. Estimates have been obtained and the total cost will not exceed £36,000. The necessary finance is to be provided by the Anglo-Oriental and General Investment Trust, Ltd.

Book Notices.

An exceedingly well-got-up booklet has just been published which describes the new radiological and electromedical department of the Royal Infirmary at Edinburgh, an account of which appeared in our pages some little while ago. Its compilers have been fortunate in obtaining permission to reprint the official report of the medical officer in charge of the department, together with an abstract of the National Physical Laboratory's report on the means of protection adopted, and to include a complete series of plans and photographs of what is considered to be one of the largest and most modern installations of its kind. This Bulletin, No. 86, will interest, and be of assistance to, all concerned with X-ray equipment. Copies are obtainable from Messrs. Watson & Sons (Electro-Medical), Ltd., London.

"Domestic Electric Heating." By H. G. Solomon, M.I.E.E. Pp. 116+iv; figs. 50. London: Crosby, Lockwood and Son. Price, 3s. net.—Apart from the opening chapter, this book deals in a very practical way with examples of the general electric heating appliances at present on the market in four sections: Electric heating of buildings; domestic electric hot water supply; domestic electric cooking; and automatic temperature regulation. The fourth chapter includes refrigerators, wash boilers, and electric irons. The introductory chapter stresses the general advantages of electric heating, and gives some calculations on the thermal effect of a current.

"Handbook of the U.S.A. Bureau of Standards." No. 10. Safety Rules for the installation and maintenance of electrical supply and communication lines (60 cents).

"Human Nature in Business," by F. Creedy. Pp. 345. London: Ernest Benn, Ltd. Price, 12s. 6d. net.

"The Propagation of Electric Currents in Telephone and Telegraph Conductors," by Dr. J. A. Fleming. Fourth Edition. Pp. xv+422; figs. 25. London: Constable & Co., Ltd. Price, 21s. net.

"The King's Engineer," No. 6, 1926-27.—The annual *Journal* of the Engineering Society and the Engineer Branch of the Old Students' Association of King's College, London. Price 2s.

"Modern Steelwork." Edited by Ernest Frander Etchells, A.R.I.B.A. Pp. 275; fully illustrated. London: Nash and Alexander, Ltd. Price 5s.—This book is a review of modern practice in the application of steelwork to bridges and buildings. It contains a number of authoritative semi-technical articles by eminent architects and consulting engineers, including Dr. Oscar Faber, Mr. J. A. Sharman, Mr. T. S. Tair, and Mr. Ewart S. Andrews.

Fire.

On July 20th a fire occurred at the Fonthill Road, Finsbury Park, works of the Ever-Ready Co. (Great Britain), Ltd. The outbreak apparently occurred in the waxing department. The managing director states that an adjoining warehouse belonging to the company was destroyed, but the fire did not injure the factory proper. Apart from the disorganisation which, it was stated, would be overcome within 48 hours, production at the factory will continue unimpaired.

The British Industries Fair.

We have already reported that the rush for space at Birmingham has resulted in a larger booking than in any previous year, and now the London Section is stated to have met with the same success. Within five weeks of the sending out of application forms demands for 100,000 sq. ft. (twice the figure for the corresponding period of last year) have been received. The Department of Overseas Trade has notified manufacturers who have not yet applied that after to-morrow (July 30th) space cannot be guaranteed.

At a recent meeting the Birmingham Tame and Rea District Drainage Board authorised the extension for a further period of five years, from Christmas next, of the lease to the Birmingham Chamber of Commerce of the buildings at Castle Bromwich. In view of the heavy expense incurred by the Chamber of Commerce in additions and alterations to the buildings, the Board also agreed to an option on the part of the Chamber for two further periods of five years each.

In a message to the Advertising Convention last week the Prime Minister described the Fair as an excellent form of co-operation between manufacturers in attracting buyers to the British market.

Unemployment.

There was a decrease of over 17,000 in the number of registered unemployed during the week ended July 11th. At that date the total was 1,036,500, as compared with 1,053,580 on July 4th and 1,644,190 on July 12th, 1926.

The National Radio Exhibition.

We have received from the Radio Manufacturers' Association a list of exhibitors at the forthcoming National Radio Exhibition at Olympia. This contains over 160 names, including those of many leading manufacturers and dealers. The Association states that up to July 15th (the date of the list) about 92 per cent. of the space had been booked; there were only 16 unlet stands on the ground floor and 11 in the gallery.

For Sale.

The Bristol Medical Officer of Health invites offers for surplus oil-engine generating plant, 7½ kW. (See our advertisement pages to-day.)

European Tube Prices.

It is reported that the European tube cartel has fixed specially low prices for the trade with Scandinavian countries owing to the keen competition of Polish and English companies in the market. The German export prices are said to be 20 per cent. below the home prices.

Prices of Raw Materials.

The following prices are only general, and they may vary according to quantities and other circumstances:—

CHEMICALS, &c.	Price July 26th.	Fortnight's inc. or dec.
a Acid, Oxalic ... ... per lb.	5¾d.	...
a Ammoniac, Sal ... ... per ton.	£60	...
a Ammonia, Muriate (large crystal) ,,	£52	...
a Bisulphide of Carbon ... ... ,,	...	...
a Borax ... ... ,,	£25	...
a Copper Sulphate ... ... ,,	£25 10s.	...
a Potash, Chlorate ... ... per lb.	4d. to 4½d.	...
a ,, Perchlorate ... ... ,,	5½d.	...
a Shellac ... ... per cwt.	£13 10s.	...
a Sulphur, Commercial ... ... ,,	£9 10s.	...
a ,, Roll ... ... ,,	£9 10s.	...
a Soda, Chlorate ... ... per lb.	3½d to 3¾d.	...
a ,, Crystals ... ... per ton.	£5 to £5 5s.	...
a Sodium Bichromate, casks ... per lb.	4d.	...
METALS, &c.		
b Aluminium, Ingots... ... ... per ton.	£107 to £112	...
b ,, Wire ... ... per lb.	1/6 to 2/-	...
b ,, Sheet ... ... ,,	1/8 to 2/9	...
p Babbitt's Metal and Anti-friction Metal—		
Grade I ... ... per ton net.	£254	£6 inc.
Grade II ... ... ,, ,,	£175	£1 inc.
Grade III... ... ... ,, ,,	£80	£2 dec.
c Brass (rolled metal 2" to 12" basis) per lb.	9½d.	...
c ,, Tubes (solid drawn) ... ,,	11½d. to 11¾d.	½d. dec.
c ,, Wire, basis ... ... ,,	9¾d.	...
c Copper Tubes (solid drawn) ... ,,	1/0½	½d. dec.
c ,, Bars (best selected) ... per ton.	£84	...
c ,, Sheet ... ... ,,	£84	...
c ,, Rod ... ... ,,	£84	...
d ,, (Electrolytic) Bars ... ,,	£61 5s.	25s. inc.
d ,, ,, Sheets ... ,,	£148 10s.	...
d ,, ,, Wire Rods ... ,,	£71 5s.	25s. inc.
d ,, ,, H.C. Wire per lb.	9d.	½d. inc.
f Ebonite Rod ... ... ,,	2/3 to 2/8	...
f ,, Sheet ... ... ,,	2/3 to 2/8	...
n German Silver Wire ... ... ,,	2/2	...
h Gutta-percha, fine ... ... ,,	2'-	...
h India-rubber, Para fine ... ... ,,	1/3	1d. dec.
l Iron Pig (Cleveland No. 3.) ... per ton.	75/-	...
l ,, Wire, galv. No. 8, P.O. qual. ,,	£91	...
g Lead, English pig ... ... ,,	£25 5s.	15/- dec.
g Mercury ... ... per bot.	£22 to £22 5s.	5/- inc.
o Mica (in original cases) small ... per lb.	3d. to 3/-	...
o ,, ,, medium ,,	4/- to 8/-	...
o ,, ,, large ... ,,	10/ to 20/- & up.	...
p Phosphor Bronze, plain castings ,,	1/3½	...
p ,, ,, drawn bars & rods ,,	1/8	...
p ,, ,, rolled strip & sheet ,,	1/2½	...
p ,, ,, wire... ... ... ,,	1/3½	...
o Platinum ... ... per oz.	£14 10s.	...
d Silicium Bronze Wire ... ... per lb.	10½d.	...
r Steel, Magnet, in bars ... ... ,,	7½d.	...
a Tin, Block (English) ... ... per ton.	£287 to £287 10s.	£7 inc.
a ,, Wire, Nos. 1 to 16 ... ... per lb.	4/9	...

*For 1 cwt. lots. Special quotations against definite specifications.

Quotations supplied by

a G. Boor & Co.
b The British Aluminium Co., Ltd.
c Thos. Bolton & Sons, Ltd.
d Frederick Smith & Co.
e F. Wiggins & Sons.
f India-Rubber, Gutta-Percha and Telegraph Works Co., Ltd
g James & Shakespeare.
h Edward Till & Co.
i Bolling & Lowe.
l Richard Johnson & Nephew, Ltd.
n P. Ormiston & Sons.
o Johnson, Matthey & Co., Ltd.
p C. Clifford & Son, Ltd.
r W. F. Dennis & Co.

In their report dated July 23rd, Messrs. James Forster & Co. stated that the firmness of the week must be ascribed more to the American position than to any material change in conditions in this country. "For some months past consumers in the U.S.A. have been apathetic and have bought sparingly, but early this week there was a general resumption of buying with the result that the official price was raised on consecutive days from 6.20 to 6.50 cents. . . . Whether the present advance is held still depends on conditions in America. If the improvement over there is maintained we should say that at no time this year has the general position of the metal been more favourable to a further advance."

Lighting and Power Notes.

Ayr.—PUBLIC LIGHTING.—The Town Council has accepted the offer of the Ayrshire Electricity Board for public lighting for one year at £3,076.

Barnes.—OPPOSITION TO BILL.—The District Council decided recently to oppose the London and Home Counties Electricity Bill now before the Select Committee of the House of Lords.

Bedford.—STREET LIGHTING SUPPLY.—The Town Council is to give a supply of electricity for street lighting to the Sandy Urban Council.

Berkhamsted. — OVERHEAD LINES BANNED. — The Council has declined to grant a further application of the Cheshunt Electric Light and Power Co. for sanction to erect overhead lines from Cheshunt Road allotments to Bourne End.

Burton-on-Trent.—SUPPLY EXTENSIONS.—The Town Council proposes to lay duplicate cables from the Castle Gresley sub-station to give a supply in two directions and to open up new sources of supply to Mount Pleasant and Linton, at an estimated cost of £3,178.

Canada.—HYDRO-ELECTRIC DEVELOPMENT.—The Gatineau Power Company, a subsidiary of the International Paper Company, has announced the purchase of the Ottawa-Montreal Power Company and the Quebec Southern Power Corporation. The first of these companies, serving a district around the junction of the Ottawa and St. Lawrence Rivers, has five plants in operation, two on the Rouge River, two on the North River, and one on the Blanche River, altogether developing 11,300 horse-power. The Quebec Southern Power Corporation has hydro-electric plants on the Ouareau River and North River, and serves a district north of Montreal. The Gatineau Company is one of the newest of Canada's hydro-electric enterprises. Its development at Farmers' Rapids, Chelsea, and Paugan Falls, all on the Gatineau River north of Ottawa, will be capable of delivering over half-a-million horse-power, of which 260,000 h.p. will be sold to the Hydro-Electric Power Commission of Ontario. The recent acquisitions, as well as the former purchases of the Maniwaki Power and Telephone Company, Hull Electric Company, Bonhomme Electric Company and Papineauville Electric Company, give the Gatineau Power Company a large field to serve, and it is announced that the various lines will be combined into one large system serving an area of 4,500 square miles.

Cannock.—EXTENSIONS.—The Urban District Council has given approval to electricity extensions in various parts of the area, at a total cost of £1,692.

Cheltenham.—LOAN SANCTIONED.—The Electricity Committee has obtained sanction for a loan of £10,000 for mains and services.

Cleethorpes.—LOAN APPLICATION.—The Council is to seek permission to borrow £11,400 for the purpose of extending the electricity supply to the southern portion of the town.

Continental.—CZECHO-SLOVAKIA.—A scheme is on foot for the promotion of a Carpathian-Ruthenian electricity company, in which the State, the local authorities, and private capital will participate.

GERMANY.—The Rhineland-Westphalia Electric Power Co. is to erect immediately at Herdecke, on the Ruhr, water-power works, which will contain four turbines, each of 3,400 h.p., at a cost of £1,000,000.

BELGIUM.—The directors of the Société d'Electricité du Nord de la Belgique, in their report for the year ended March 31st last, state that during the past 12 months the number of consumers increased from 52,371 to 67,094, and the power demand from 63,147 to 74,459 kW. In order to meet the increasing demand, 162 miles of new mains were laid, bringing up the total to 1,328 miles. It has been decided to extend the 50,000-V transmission line between Alost and Hamme as far as St. Nicholas.

The Société d'Electricité du Bassin de Charleroi also reports an increase in the number of consumers from 36,929 to 40,218. Owing, however, to the transfer of two large consumers to another distribution system, the load has fallen from 52,522 to 46,780 kV. During the year 68½ miles of new mains were laid, bringing the total up to about 830 miles.

The Council of the Brabant Province proposes to take a 50 per cent. share in a company to be organised to carry through the electrification of the province.

Croydon.—YEAR'S WORKING.—In his report on the year's working, ended March 31st, 1927, of the electricity undertaking, the engineer and manager, Mr. A. C. Cramb, shows that the total income for the year amounted to £269,557, an increase of £46,000 over the preceding year. The total working expenses amounted to £136,354, as compared with £95,043 for the previous year, resulting in a gross profit of £133,203. After the deduction of capital charges and special expenditure of a capital nature, the resulting net surplus is £10,230, as against £9,194. The capital expenditure during the year amounted to £100,751, which included £15,911 for generating plant and

£25,424 for boiler plant. The total number of units generated during the year amounted to 32,935,428, and the maximum load on the station was 13,400 kW.

Daventry.—OVERHEAD LINES.—The Rural Council has consented to the Northampton Electric Light Co. using overhead cables for the supply of electricity in the parish of West Haddon.

Dover.—BULK SUPPLY.—The Corporation has decided to ascertain the terms of the Folkestone Electricity Supply Co., Ltd., and the East Kent Power Co., for bulk supplies.

Dundee.—SELECTED STATION.—The Electricity Committee has received an intimation from the Central Electricity Board that Carolina Port is a selected station in the full sense of the term.

Ealing.—BULK SUPPLY.—The Mayor opened the new electricity distributing station in Popes Lane, which was described in our April 1st, 1927, issue, on July 25th. Tea was provided, and after the chairman had made a few remarks relative to the necessity for the provision of the station, he called upon the borough electrical engineer, Mr. J. Douglas Knight, to give a few details of its engineering features. Members of the Council and visitors were taken round the station in groups, and the various types of machinery installed therein were explained to them. There was on view a display of electrical domestic, &c., apparatus.

Great Yarmouth.—YEAR'S WORKING.—The accounts of the electricity undertaking (engineer and manager: Mr. P. G. Campling) for the year ended March 31st last show a total income of £68,340, as compared with £56,416 for the previous year. The total expenditure was £38,935, against £29,988, resulting in a gross profit of £29,405 (£26,427). After the deduction of capital expenses, &c., there is a net profit of £335, against £4,676 for the previous year. The total capital expenditure during the year amounted to £137,694, which included £47,856 spent on new generating plant, £54,551 on mains, and £14,537 for the change-over of motors, &c. The units sold during the year amounted to 4,603,704.

Greenock.—SUPPLY EXTENSION.—The Corporation has decided to proceed with the work of laying the cable to supply Inverkip and Wemyss Bay, at a cost of £10,000.

Hebden Bridge.—SUPPLY FAILURE.—During a thunderstorm on July 21st the whole of the electric lighting in the locality failed.

Kettering.—YEAR'S WORKING.—The results of the year's working, ended March 31st last, of the electricity undertaking (electrical engineer and manager: Mr. W. A. Walker) show a total income of £61,245, as compared with £49,852 for the previous year. The working expenses amounted to £39,806, against £27,990, leaving a gross profit of £21,439 (£21,862). The deduction of capital charges, &c., leaves a net surplus of £358, against £3,959. The capital expenditure during the year amounted to £40,111, which included £12,527 for machinery and £5,886 for mains. The units sold during the year totalled 6,168,186, an increase of 840,746 on the figure for the preceding year. The maximum load on the station during the year was 3,960 kW.

Lancaster.—YEAR'S WORKING.—The accounts of the electricity undertaking (borough electrical engineer: Mr. Geo. C. Milnes) for the year ended March 31st last show a total income of £30,309, as compared with £33,685 for the previous year. The working expenditure amounted to £24,835, against £18,645, leaving a gross profit of £5,474 (£15,040). After allowing for the capital expenses the result is a net loss of £220, as compared with a net profit of £2,309 for the year ended March 31st, 1926. The capital expenditure for the year amounted to £21,130, which included £17,187 for mains. The total number of kWh sold during the year was 2,087,103, and the maximum load on the station was 2,112 kW.

London.—SHOREDITCH.—*New Offices.*—The Lighting Committee has approved of the lay-out of the new electricity offices, stores and showrooms, which, it is estimated, will cost about £18,000.

METROPOLITAN SUPPLY CO.—The company is to lay a 6,600-V cable from the sub-station in Tower Street to Savoy Street.

POPLAR.—*Year's Working.*—The annual report of Mr. J. Horace Bowden, general manager and chief engineer of the electricity undertaking, for the year ended March 31st, 1927, shows a total income of £232,275, as compared with £200,360 for the previous year, and a total expenditure of £174,551, against £116,675, leaving a gross profit of £57,724 (£83,685). After deducting the capital charges, &c., the result is a net loss on the year's trading of £21,274, as compared with a profit of £14,268 for the preceding year. The capital expenditure during the year was approximately £100,000. The units sold during the year amounted to 35,269,483, 79.34 per cent. of the quantity generated. The average cost per kWh generated was 0.574d., and per kWh sold 0.724d. The maximum demand on the undertaking for the year was 15,800 kW.

HAMMERSMITH.—The Electricity Committee has recommended furnishing a supply of electricity to premises on the Old Oak estate of the L.C.C., at a total cost of £9,200.

Mexico.—ELECTRICITY SUPPLY.—A new sub-station to supply Tucubaya, in the Federal District, with a capacity of 200,000 kVA, is to be constructed.

La Compañia Mexicana de Luz y Fuerza Motriz, S.A., has placed orders for electrical equipment for the automatic working of the installations at Tlilan, Villada, and Fernandez Leal.

Midhurst.—SUPPLY SCHEME.—An Order has been granted to the Midhurst and District Electricity Co. to lay mains and supply electricity in ten parishes in the district.

Northallerton.—SUPPLY POWERS.—The Rural District Council has decided to offer no objection to powers being granted to the Northallerton Electricity Company to undertake all public lighting and power supplies for the district of Romanby.

Norwich.—LOAN APPLICATION.—The Town Council has applied for a loan of £50,000 for mains and services.

Preesall.—LOAN APPLICATION.—The Urban Council has applied for sanction to borrow £3,000 for new mains and services.

Portsmouth.—YEAR'S WORKING.—The accounts for the electricity undertaking (engineer and manager: Mr. B. Handley) for the year ended March 31st last show a total income of £234,162, as compared with £174,692 for the previous year. The total expenditure was £175,507, against £107,266, leaving a gross profit of £58,658 (£67,425). The net profit for the year, after the deduction of the capital expenses, &c., is £2,143, as compared with £19,783. The capital expenditure during the year amounted to £97,084, which included £56,760 for mains. The maximum demand for the year was 11,200 kW, and the total units generated 27,427,000.

Preston.—LOAN APPLICATION.—The Corporation is to apply for sanction to borrow £60,387, the amount expended in excess of the borrowing powers in connection with the two first sets and the approach road at the Ribble power station.

Price Reductions.—WEYMOUTH.—The Town Council has made the following reductions in the charges for electricity:—Lighting: From 7d. to 6½d. per unit, with discount. Power: From 2d. to 1½d. net. Cooking: From 1½d. to 1d. Heating: From 2d. to 1½d. Contract: From 1½d. to 1d. Public lighting: From 3½d. to 3d. net.

BECKENHAM.—The Urban Council has adopted the following new scale:—Lighting, 6d. per kWh; no reduction on the flat rate, but a reduction on the fixed charge of from 12½ per cent. and 6 per cent. to 12 per cent. and 5 per cent. on the rateable value contained in the "all-in" tariff, and a further reduction in the unit charge; public buildings, from 5½d. to 5d. per kWh; cooking, from 1½d. to 1d.; power, from 2d. to 1d.

TAUNTON.—The Town Council has made the following reductions, to take place from October:—Lighting, up to 500 kWh per quarter, from 6d. to 5d.; 500 to 1,000 kWh, from 5d. to 4d.; beyond, from 4d. to 3d. Heating and cooking, from 1½d. to 1d. Power, up to 2,000 kWh per quarter, from 2½d. to 2d.; 2,000 to 4,000 kWh, from 2d. to 1½d.; over 4,000, from 1½d. to 1¼d.; beyond 32,000 kWh per annum, 1d. Public lighting charge reduced from £2,000 to £1,500 per annum.

Reigate.—LOAN APPLICATION.—The Town Council is to apply for a loan of £50,000 for the provision of a new distribution system.

South Africa.—CAPE TOWN.—The Corporation is to raise a loan of £500,000 for the development of the electricity undertaking.

In connection with the supply of electricity in the Muizenberg area, the Electricity Committee proposes to provide sub-stations in Atlantic Road, Muizenberg, and at Lakeside, at a total cost of £6,690.

MOORREESBURG.—The Cape Province electric lighting installation was formally inaugurated by the Mayor on June 25th.

Special Orders.—Application has been made to the Electricity Commissioners by the Great Yarmouth Corporation for a Special Order to supply electricity in the urban district of Diss and parishes in the rural districts of Loddon and Clavering and Depwade, in the county of Norfolk; the boroughs of Beccles and Eye, the urban district of Halesworth, the rural district of Hoxne, and parishes in the rural districts of Wangford and Blything, in the county of Suffolk. The Ipswich Corporation asks for a Special Order to supply electricity in the urban district of Stowmarket, the rural districts of Bosmere and Claydon, East Stow, Hartismere and Samford, and parishes in the rural districts of Plomesgate and Woodbridge, in the county of East Suffolk, the urban district of Hadleigh and the rural districts of Brandon (except the parishes of Brandon and Santon Downham), Cosford, Thedwastre and Trungoe, in the county of West Suffolk.

Application is intended to be made by the Corporation of King's Lynn for a Special Order to supply electricity in the urban districts of Downham Market, Swaffham, and Wells-next-the-Sea, the rural districts of Downham, Freebridge, Lynn, King's Lynn, Swaffham and Marchland, and parts of the rural districts of Dorking, Walsingham, Mitford and Launditch and Thetford, in the county of Norfolk.

The Electricity Commissioners have submitted to the Minister of Transport for confirmation a Special Order for the supply by the Leicestershire and Warwickshire Electric Power Co. of electricity within the rural district of Castle Donnington and parts of the rural districts of Ashby-de-la-Zouch and Loughborough, in the county of Leicester, and part of the rural district of Shardlow, in the county of Derby.

Stafford.—YEAR'S WORKING.—The accounts of the electricity undertaking (engineer and manager: Mr. W. H. Robins) for the year ended March 31st last show a total income of £47,785, as against £39,045 for the previous year, and a total working expenditure of £28,411, as against £15,125, leaving a gross profit of £19,374 (£23,920). After the deduction of capital charges, &c., the result is a net loss of £1,535, as against a net profit of £12,213 for the preceding year. The units generated during the year amounted to 7,881,709, and the maximum demand on the station was 3,939 kW.

Stoke-on-Trent.—SUPPLY SCHEME.—The Electricity Committee has received intimation that the Electricity Commissioners have decided to proceed with a scheme under Section 36 of the Electricity (Supply) Act, 1926.

MAINS EXTENSION.—The Corporation Electricity Committee is to lay a main in Scotia Road, Burslem, at a cost of £1,150.

COLLIERY SUPPLY.—The Electricity Committee has decided to give a supply to the Faxfield Colliery, subject to the Electricity Commissioners sanctioning the proposed new 10,000-kW set.

Weymouth.—INQUIRY.—Col. Ekin held an inquiry on July 12th into the application of the Town Council for an Order to extend the area of supply so as to include the whole of the Weymouth rural area and portions of the districts of the Dorchester, Wareham, and Purbeck Rural Councils. Objection was made on the part of the Weymouth Consumers' Gas Co. on the grounds that they, as large ratepayers, objected to having to share the risks of what might be a speculative rival concern, and the company submitted that no further powers ought to be granted except under the Newport Act and the Northumberland clause, but the Corporation objected to both.

Tramway and Railway Notes.

Australia.—AUCKLAND.—The City Council has authorised a loan of £500,000 for 30 years for tramway extensions and plant.

Brazil.—SAO PAULO.—The Light and Power Co. has presented to the City Administration a proposal for the betterment of the local transportation service, at a cost of nearly $10,000,000.

Buenos Aires.—TRAMWAY ACCIDENT.—Ten people were killed and 33 injured in a tramcar accident at Lima, Callao Province, Peru, when the brakes of the vehicle failed on a steep incline.

Continental.—HUNGARY.—It has been decided that the power station for the electrification of the Transdanubian shall be erected in the Tata coal district. Detailed plans are to be elaborated on the basis of which definitive estimates and working costs will be drawn up. The result of these calculations will then be of decisive importance in respect of the acceptance of the financial offer of the English Talbot group.

Great Yarmouth.—YEAR'S WORKING.—The accounts for the tramway undertaking (general manager and engineer: Mr. P. G. Campling) for the year ended March 31st last show, for the tramway section, a total income of £37,049, as against £39,159 for the previous year. The total working expenses (9.89d. per car mile) amounted to £21,705, as against £24,236, leaving a gross profit of £15,344 (£14,923). After deducting the capital charges, and so on, a net profit of £4,783 is shown. The total passengers carried during the year was 4,104,323 for a car mileage of 526,708.

The total income for the 'bus section was £13,156, as compared with £11,552 for the previous year, and the working expenses amounted to £9,569, against £8,733, leaving a gross profit of £3,586 (£2,819). After the deduction of the capital charges, a net profit of £2,233 is shown.

Huddersfield.—'BUS SERVICE.—Huddersfield Corporation is to make another application for powers to run a 'bus service through to Bradford.

Japan.—RAILWAY ELECTRIFICATION.—The Ministry of Railways is said to be likely to sanction the construction of the following electric railways:—Keihoku Electric Railway, between Itabashi and Omiya; Joto Electric Railway, between Kameido and Ojimo; Oji Electric Railway, between Hachioji and Asakawa; Yoyogi Electric Co., between Hatagaya and Shibuya; Musashino Electric Co., between Nerima and Shimo-Tozuka; Tamagawa Electric Co., between Shinagawa and Kami-Meguro; Tokio belt line, between Shinagawa and Suzaki; Tokio belt line, between Shinjuku and Shibuya; and Tokio electric trolley line, between Nagasuki-mura and Hatagaya. All these are extensions of lines already in operation.

OSAKA.—The Government has authorised the municipality to construct 35½ miles of underground railway, at a cost of y.162,000,000.

London.—L.C.C. TRAMWAYS.—The L.C.C. has decided in favour of enlarging the tramway subway, which connects Southampton Row with the Victoria Embankment, so that it will accommodate double-deck cars. Application is to be made for the necessary authority.

UNDERGROUND.—A mechanical defect on a northbound train caused some delay on the Morden line of the Underground during the morning rush hours of July 21st. The maximum delay of 25 minutes was due to the fact that just north of Kennington a disabled train was being worked into a siding.

LEWISHAM.—The L.C.C. Tramways Committee recommends the extension of the tramways from Southend Village to Grove Park, Lewisham, at a cost of £18,000.

Matlock.—TRAMWAY ABOLISHMENT.—The Council has decided to abolish the tramway undertaking.

Oldham.—YEAR'S WORKING.—The annual report of Mr. C. Jackson, general manager and engineer of the Oldham Tramways Department, for the year ended March 25th last shows, for the tramway services, a total income of £227,546, as compared with £230,652 for the previous year. The total working expenses amounted to £195,657, against £191,829, leaving a gross surplus of £31,889 (£38,823). The deduction of capital charges, &c., leaves a net profit of £365. For the motor-'bus service the total income was £42,428, the working expenses £34,024, the gross surplus £8,404, and the net profit £1,931. The total capital outlay for the year, for both services, was £48,729, which included £20,388 for tramcars and £14,515 for omnibuses. The total mileage of the tramcars was 2,684,867, the number of passengers carried 34,491,193, and the net working expenses per car mile 14.368d.

Telegraph and Telephone Notes.

India.—"BEAM" RADIO-TELEGRAPHY.—The statement telegraphed to England from Bombay that the England-India "beam" wireless service was officially inaugurated in Bombay on July 23rd by the Viceroy was not correct. The Viceroy visited Bombay to open the broadcasting station, and while there he inspected the Central Telegraph Office of the Indian "beam" service and exchanged messages with the King. Before the monsoon season started, it was expected that the official Post Office tests would be completed in time for Lord Irwin to inaugurate the "beam" service officially on July 23rd. For some weeks past the English and Indian stations have been in daily communication at high speed, but when the monsoon began it unexpectedly caused trouble on the Indian land lines connecting the Central Telegraph Office with the wireless stations, which cannot be officially opened until the Post Office test has been passed.

Irish Free State.—AUTOMATIC TELEPHONY.—On July 24th 700 lines of the first public automatic exchange in Ireland were cut-over into service at the Ship Street exchange, Dublin. It is the first portion of an automatic network (similar to that now being installed by the British Post Office) to come into service, and another exchange, known as Merrion, will be opened in the autumn. The whole contract is in the hands of Standard Telephones and Cables, Ltd., which company is manufacturing the apparatus in its entirety at its Hendon factory.

Switzerland.—TELEGRAPH REGULATIONS.—The International Union of Municipal Representatives held a general meeting at Berne on June 16th under the presidency of Senator F. M. Wibaut, of Amsterdam. Fifty delegates were present from various European countries, including Great Britain and France. The meeting adopted a proposal for new telegraph regulations.—*Reuters* (Berne).

Radio Notes.

Germany.—LICENCES.—The healthy state of the German broadcasting industry is indicated by the number of subscribers at the end of the second quarter of this year. On June 30th there were 1,713,899 subscribers, an increase, compared with last quarter, of 78,171. Reckoning three listeners to every set licensed, about 10 per cent. of the German population may be considered to be listeners, says *World Radio*. By the end of the year it is hoped to reach the 2,000,000 figure.

India.—BROADCASTING INAUGURATED.—The Viceroy inaugurated the Bombay station of the Indian Broadcasting Co., Ltd., on July 23rd. Its call signal is 2BY and its present power is 3 kW; receiving licences are being issued at Rs. 10 (15s.) per annum.

Holland.—SHORT-WAVE TESTS.—The interest which was recently created by the successful transmission from the Eindhoven (PCJJ) station (wave-length, 30.2 metres), which was received in India, Dutch East Indies, South America, Australia, &c., in addition, of course, to European countries,

has induced the station to experiment further in order to ascertain the most suitable time for transmission to various countries throughout the world. For this purpose a special short-wave transmission commenced on July 26th at 10.40 G.m.t. and continued until July 27th at 10.40 G.m.t. Enthusiasts who were successful in hearing the station are asked to communicate direct with Philips experimental broadcasting station at Eindhoven, Holland, stating the results obtained.

Malaya.—NEW COMPANY.—A sum of $34,000 has been added to the Federal estimates of the F.M.S. for the erection of wireless stations and quarters for operators and mechanics at Port Swettenham and Batu Pahat, Johore. In this connection, Malayan Broadcasting Services, Ltd., has been floated, says *Eastern Engineering*, to broadcast on a short wave and do relay work. Mr. Leslie Cant, who will be manager, has had several years' experience in Australia, while the company is to appoint an experienced programme director.

Russia.—BROADCASTING STATIONS.—It is reported from Leningrad that there are now 56 radio broadcasting stations in operation in Soviet Russia. Of that number, five are in Leningrad and nine in Moscow.

Sweden.—LICENCE EXTENSION.—Under a new resolution of the Swedish Government, the Broadcasting Co. ("Radiotjänst," Ltd.) has obtained a two years' extension of its licence to the end of 1929. At the same time, however, the Radiotjänst's proportion of the licence income has been further reduced; at first the division between the company and the Telegraph Board was equal, but from the beginning of 1927 Radiotjänst was granted only 3.72 Swedish crowns from each licence fee of 10 cr., and now its share has been reduced to 3.30 cr. This division is to be revised yearly, and *World Radio* explains that in several other ways the Government has also strengthened its influence on the company.

Contract Information.

When "Contracts Open" are advertised in our "Official Notice" pages, the date of the ELECTRICAL REVIEW containing the advertisement is given in parentheses below.

Contracts Open.

Adwick-le-Street.—August 8th. Urban District Council. Cast-iron lamp columns, lanterns, time switches, cables, joint boxes, &c. (July 22nd.)

Amberley Castle (Sussex).—Cleaning out 4½ miles of waterways, supply and erection of ejector plants, electric lighting installation, pumping plant, and fire hydrant system. (July 22nd.)

Australia.—MELBOURNE.—November 14th. State Electricity Commission of Victoria. Two 10,000-kW back-pressure turbo-generators and accessory plant. (July 1st.) One 40-ton single-crab, 3-motor type electrically-operating travelling crane. (July 15th.)

Eight tubular steam coal driers; seven electrically-operated briquette presses; central waste coal dust collecting system. (A.X. 4911.)*

November 21st. Five centrifugal feed pumps.

November 28th. Four h.p. water-tube boilers and accessory plant and steel work for buildings.

September 13th. Postmaster-General's Department. Automatic switching equipment. (B.X. 3658.)*

September 20th. Telephone switchboard keys and parts. (B.X. 3657.)*

Belfast.—August 10th. Education Committee. Electric motors, dynamometers, &c., for the Electrical Engineering Department, Municipal College of Technology. (July 22nd.)

Dublin.—Dublin United Tramways Co. (1896), Ltd. Eleven miles of 3-core lead-covered e.h.p. cable. (See this issue.)

Edinburgh.—August 22nd. Electricity Supply Department. H.p. and l.p. steam and water pipes, circulating-water pipes, flue dust extraction plant, h.p. steam and water valves, and l.p. water valves. (July 15th.)

India.—August 5th. South Indian Railway Co., Ltd. Electric lamps. Spec. (5s.) from the company's offices, 91, Petty France, Westminster, S.W.1.

August 9th. India Stores Department. 6½ miles 40 conductor armoured cable. (See this issue.)

Leeds. — September 17th. Electricity Department. Boiler-house equipment, including conveying plant, wharf cranes, &c., for the first section of a new generating station. (July 22nd.)

London.—METROPOLITAN ASYLUMS BOARD.—August 5th. Installation of c.b. telephone fire alarm, and call bell system at the Southern (Lower) Fever Hospital, Dartford, and rewiring part of fire-alarm system at Darenth Training Colony. (July 22nd.)

Lossiemouth.—August 6th. Town Council. Electric lighting installation of four blocks of flatted houses. Schedules, &c., from Mr. A. G. D. Grant, burgh surveyor.

Manchester.—August 5th. Electricity Committee. One portable centrifugal oil purifier for 33,000-V transformers. (July 22nd.)

August 19th. Twelve months' supply of electric cooking ranges, switches, and cut-outs. (See this issue.)

New Zealand.—WELLINGTON.—September 13th. Public Works Department. Two sets 110-kV outdoor switchgear for the Waikato electric power scheme. (B.X. 3579.)*

October 4th. Batteries and charging sets for Mangahao electric power scheme. (B.X. 3580.)* 50-kV lightning arrestors for Waikaremoana. (B.X. 3603.)* 11,000-V switchgear and metering equipment. (B.X. 3602.)* 50-kV lightning arrestors for Waikato. (B.X. 3605.)*

September 27th. One 15-ton electrically-operated overhead travelling crane. (A.X. 4849.)*

October 25th. 10,000-kVA transformers for Waikato. (B.X. 3604.)*

November 24th. New Zealand Government Railways. Heating elements, complete with control gear for electric ovens, electric water heaters, electric steam boiler. (B.X. 3649.)*

South Africa.—JOHANNESBURG.—August 29th. Municipal Council. One 75-kW rotary convertor and transformer. (B.X. 3661.)*

Uruguay.—MONTEVIDEO.—August 5th. State Electricity Works. 16,522 l.p. a.c. meters and spares. (B.X. 3596.)*

Wick.—August 22nd. Town Council. Distribution mains, services, &c., generating machinery, equipment, &c., station building, &c.; hydro-electric plant, &c. Schedules from Mr. J. E. MacEwan, 108, Douglas Street, Glasgow.

Worksop.—August 8th. Installation work in connection with the Council's hired wiring scheme. Specifications from Engineer and Manager, Electricity Works, Canal Road.

* Further particulars can be obtained at the Department of Overseas Trade (Inquiry Room), 35, Old Queen Street, S.W.1.

Contracts Closed.

Ayrshire.—Education Committee. Accepted:—Installing electric light for extensions to Furance Road higher-grade school, Muirkirk (£192).—W. G. Dodd, Ltd.

Bradford.—Tramways Committee. Accepted:—Upholstered seating, in moquette, for five cars (£101 4s. per car).—English Electric Co., Ltd.; and for four cars (£106 10s. 3d. per car).—G. D. Peters & Co., Ltd.

Caerphilly.—Urban Council. Installing electric light at 100 houses:—

	£
D. Williams. (Accepted.)	**499**
E. P. Bowen	504
F. Lockett	504
H. C. Vaughan	512
J. H. Miles	524
C. F. Cox	525
John Evans	546
T. J. Rees	571
R. G. Cooper	581
Landray & Chapman ...	588
H. Charley	600
Higginbotham & Son ...	630
R. Hudson	630
General Electric Maintenance Co.	630
W. J. Stephens	638
S. T. Robottom	645
W. Watts & Co.	651
Glamorgan Electricity Co.	660
E. Gethin	683
Alger & Sons	751
C. Artingstall	830
W. Webb & Co.	840
Electrical Institute and Supplies Co.	931

Dundee.—The Electricity Committee last week accepted tenders for cable of German make valued at £6,800. There were twelve items in all, and the nearest British offer was £8,600.

Government Contracts.—The following contracts were placed by various Government Departments during June, 1927:—

ADMIRALTY, CONTRACT AND PURCHASE DEPARTMENT.

Motor bollards.—Laurence, Scott & Co., Ltd.
Cable.—Enfield Cable Works, Ltd.; Johnson & Phillips, Ltd.
Electrodes.—Alloy Welding Processes, Ltd.
Electric fans and motors.—Electro-Dynamic Construction Co., Ltd.
Motor-driven centrifugal pump.—Worthington, Simpson, Ltd.
Induction regulators.—Johnson & Phillips, Ltd.
Telemotor-operated vent valves.—MacTaggart, Scott and Co., Ltd.

WAR OFFICE.

Positive carbons.—General Electric Co., Ltd.

AIR MINISTRY.

Battery (Martlesham Heath).—Tudor Accumulator Co., Ltd.
Electric cable.—W. T. Henley's Telegraph Works Co., Ltd.
Resistance and voltmeter control.—E. Turner.
Hand generators.—M.L. Magneto Co., Ltd.
Magnetos.—British Thomson-Houston Co., Ltd.; North and Son, Ltd.
Navigation lamp spares.—Siemens Bros. & Co., Ltd.

POST OFFICE.

Telephone apparatus.—Ericsson Telephones, Ltd.; International Electric Co., Ltd.; Peel-Conner Telephone Works, Ltd.; Siemens Bros. & Co., Ltd.; Standard Telephones & Cables, Ltd.; Telephone Mfg. Co., Ltd.
Wireless apparatus.—General Electric Co., Ltd.
Battery stores.—Siemens Bros. & Co., Ltd.; C. A. Vandervell & Co., Ltd.
Terminal blocks.—T. De la Rue & Co., Ltd.
Cable.—Connollys (Blackley), Ltd.; Enfield Cable Works, Ltd.; W. T. Glover & Co., Ltd.; Hackbridge Cable Co., Ltd.; W. T. Henley's Telegraph Works Co., Ltd.; Pirelli-General Cable Works, Ltd.; Siemens Bros. and Co., Ltd.
Loading coils.—General Electric Co., Ltd.
Telephone cords.—International Electric Co., Ltd.; Phœnix Telephone & Electric Works, Ltd.; Siemens Bros. and Co., Ltd.; Standard Telephones & Cables, Ltd.
Ducts.—Albion Clay Co., Ltd.; Doulton & Co., Ltd.
Dynamotors.—W. Jones & Co.
Bronze wire.—Greenwich Cable Works, Ltd.
Cadmium copper wire.—T. Bolton & Sons, Ltd.; R. Johnson & Nephew, Ltd.
Copper wire.—Elliotts Metal Co., Ltd.
Copper and enamelled wire.—Connollys (Blackley), Ltd.
G.I. wire.—Dorman, Long & Co., Ltd.; Shropshire Iron Co., Ltd.; Whitecross Co., Ltd.
Replacing batteries, Southampton Telephone Exchange.—Alton Battery Co., Ltd.
Manufacture supply drawing-in and jointing cable.—London-Amersham (Chorley Wood-Amersham section): W. T. Henley's Telegraph Works Co., Ltd. Bradford-Airedale (Bradford Exchange-Keighley Exchange section): Pirelli-General Cable Works, Ltd. Mansfield-Clown (Barlborough): Johnson & Phillips, Ltd. Bradford-Airedale (Bradford Exchange-Skipton Exchange section): British Insulated Cables, Ltd.
L.p. switchgear and l.p. caables.—Metropolitan automatic telephone exchange: J. G. Statter & Co.
Telephone exchange equipment.—Southend-on-Sea, Leigh-on-Sea: Standard Telephones & Cables, Ltd. Sub-contractors: Electric Construction Co., Ltd., for charging machines; Crompton & Co., Ltd., for ringing machines; Chloride Electrical Storage Co., Ltd., for batteries. Marine (Southend-on-Sea): Standard Telephones & Cables, Ltd. Sub-contractors: Crompton and Co., Ltd., for ringing machines; Chloride Electrical Storage Co., Ltd., for batteries. Thorpe Bay, Hadleigh, Rochford, and Great Wakering: Standard Telephones & Cables, Ltd. Sub-contractor: W. Jones and Co., for ringing machines. Upminster: Standard Telephones & Cables, Ltd. Sub-contractors: Electric Construction Co., Ltd., for machines; Tudor Accumulator Co., for batteries. Belfast (Relief): Standard Telephones & Cables, Ltd. Hillside Park (Finchley, N.): Automatic Telephone Mfg. Co., Ltd. Sub-contractors: Newton Bros. (Derby), Ltd., for machines; Tudor Accumulator Co., Ltd., for batteries. York: Automatic Telephone Mfg. Co., Ltd. Giffnock (Glasgow): Ericsson Telephones, Ltd. Reliance (T.E.17): General Electric Co., Ltd. Sub-contractors: Crompton & Co., Ltd., for machines; D.P. Battery Co., Ltd., for batteries. Liverpool area, Croydon (automatic): Siemens Bros. & Co., Ltd. Barrow-in-Furness Corporation, Brintons, Ltd. (Kidderminster), Waring and Gillow, Ltd. (W.1), Meccano, Ltd. (Liverpool): Relay Automatic Telephone Co., Ltd.

CROWN AGENTS FOR THE COLONIES.

Battery materials.—Siemens Bros. & Co., Ltd.
Cables.—Brown Lenox & Co., Ltd.; Callender's Cable and Construction Co., Ltd.
Electric lighting equipment.—J. Stone & Co., Ltd.
Fans.—Crompton & Co., Ltd.
Switchgear.—Ferguson, Pailin, Ltd.
Telegraph instruments.—India, Rubber, Gutta Percha and Telegraph Works Co., Ltd.
Telephones.—Ericsson Telephones, Ltd.; Peel-Conner Telephone Works, Ltd.

Grimsby.—Electricity Committee. Recommended:—Equipment of the Old Clee substation with transformer and switchgear (£1,475).—Metropolitan-Vickers Electrical Co., Ltd.

Irish Free State.—DUBLIN.—Controller of Stores (Posts and Telegraphs). Accepted:—

Batteries.—Ever-Ready Co., Ltd.
Telephone bells.—Telephone Manufacturing Co., Ltd.
Battery boxes.—O'Keeffe & Co., Ltd.; Perry & Co., Ltd.
Cable, various.—W. T. Henley's Telegraph Works Co., Ltd.
Cells (for batteries).—General Electric Co., Ltd.; Siemens Bros. & Co., Ltd.
Ebonite tube, sheet and rod.—Siemens Bros. & Co., Ltd.
Lamps, electric.—Edison Swan Electric Co., Ltd.; General Electric Co., Ltd.
Micrometer, &c.—Buck & Hickman, Ltd.
Wire, electric.—W. T. Henley's Telegraph Works Co., Ltd.
Wire, galvanised iron.—Dennis & Co., Ltd.
Zinc rods (for telegraphs and telephones).—Siemens Bros. and Co., Ltd.

—Irish Electrician.

DUBLIN.—Borough Commissioners. Accepted:—

H.p. and l.p. cables.—Siemens-Schuckert (Ireland), Ltd.; C. J. Vogel.
H.d. copper aerial conductors.—Pirelli-General Cable Works Ltd.
C.i. troughing.—Hammond Lane Foundry Co., Ltd.
Stoneware troughing.—Albion Clay Co., Ltd.
Section pillars and disconnecting boxes.—British Insulated Cables, Ltd.
Service boxes.—Lucy & Co., Ltd.; Hammand Lane Foundry Co., Ltd.
Compound.—Berry, Wiggins & Co., Ltd.

—Irish Builder and Engineer.

Lamp Contracts.—The NELSON ELECTRIC CO., LTD., informs us that it has received a twelve-months' contract for 36 items out of 38 in the matter of the supply of lamps to the Metropolitan Railway Co. The company has also received an order for lamps from the Metropolitan Water Board. Contracts for lamps have been placed with the Siemens & English Electric Lamp Co., Ltd., by the Metropolitan Water Board and the Stores Committee of the L.C.C.

The Aberdeen Line has placed an order for lamps with the Edison Swan Electric Co., Ltd.

London.—LONDON COUNTY COUNCIL.—Education Committee.

Electric lighting installation at Everington Road school, Fulham:—

Holder & Snider	£439
W. & G. Firmin	500
Alpha Mfg. and Electrical Co., Ltd. (Recommended.)	**500**
Bailey & Incledon, Ltd.	507
Anderson, Angell & Co.	517
A. Higginbotham & Sons	520
A. Hawkins & Sons	539
E. Wender	540
H. Shaw	570
S. Hellyar, Ltd.	630
Smith & Hammond, Ltd.	639
J. Briggs, Electrical Contractors, Ltd.	695
Ridout & Ratcliff, Ltd.	720
R. Hunt & Co., Ltd.	723
H. G. Gunner	790
Stegman & Co.	817

Electric lighting installation at Albion Central School, Stoke Newington:—

E. Wender	£329
Gaillard, Robinson & Co.	364
Stegman & Co. (Recommended.)	**390**
A. Higginbotham & Sons	390
Alpha Mfg. & Electrical Co., Ltd.	390
A. Hawkins & Sons	398
G. W. Shephard	462
Electrical Contracts and Maintenance Co. (1925), Ltd.	467
W. Webb	508
Globe Electrical Co.	508
Linzell, Dickinson & Co.	680
W. B. Erlebach	850

HAMMERSMITH.—Electricity Committee. Recommended:—Forced-draught fan and motor, &c. (£437).—Davidson and Co., Ltd.

METROPOLITAN ASYLUMS BOARD.—Works Committee. The following tenders were received for the overhaul and repair of electric generating sets at Colindale Hospital :—

Pilot Engineering Co.	£322
London Graving Dock Co., Ltd.	345
F. G. Payne & Co.	354
Harland & Wolff, Ltd.	413
J. Downton & Co., Ltd.	760

Repair of electrical storage battery at the Northern Hospital :—

Tudor Accumulator Co., Ltd. (Recommended) ...	£113
Hart Accumulator Co., Ltd.	116
Chloride Electrical Storage Co., Ltd.	117

Rewiring certain buildings at the Southern Hospital (£190). —Reid & Partners, Ltd. (Recommended.)

ST. MARYLEBONE.—Electric Supply Committee. Recommended :—

Oil-cooled transformers for 12 months.—Bruce, Peebles and Co., Ltd.

Switchgear for 12 months.—Ferguson, Pailin, Ltd., and Metropolitan-Vickers Electrical Co., Ltd.

STEPNEY.—Electricity Supply Committee.

25 tons of pitch (£118).—Smith's Tar Distillery, Ltd. (Accepted.)

Motor-generator for the meter testing department (£231). —Crompton & Co., Ltd. (Recommended.)

South Africa.—CAPE TOWN.—Electricity Committee. Accepted :—

Switchgear (£7,872).—A. Reyrolle & Co., Ltd.

Coal hoppers and chutes for boiler house extension (£387). Britannia Engineering Works.

Meters (£829).—F. W. Searle (British Sangamo Meter).

Torquay.—Town Council. Accepted:—

Additional switchgear and cables for the Newton Abbot Power Station at £2,770.—British Thomson-Houston Co., Ltd.

17 100-kVA transformers at £1,371.—Hackbridge Transformer Co., Ltd.

Weymouth.—Electricity Committee. Accepted:—

Coal-conveying plant (£1,660).—Babcock & Wilcox, Ltd.

Whitehaven.—Rural District Council. Accepted:—

Overhead transmission lines and street lighting.—T. S. Bell & Co. (Whitehaven).

Willington (Co. Durham).—Urban Council. Accepted:—

Installing electric light at houses at £140.—Mr. R. Robson.

York.—Electricity Committee. Recommended:—

3,000 yards of cable (£1,176).—General Cable Manufacturing Co., Ltd.

Education Committee. Accepted :—

Electric lighting, Skipton Street School (£281).—Corporation Electricity Committee.

The "Electrical Review" Service Department.

INQUIRIES must be accompanied by a stamped addressed envelope.

We should be glad to learn the names and addresses of makers of the following :—

FOUNTAIN portable electric lamp.

GOVERNOR fire screen and radiator.

ELTON immersion heater.

An electric iron fitted with red lamp signal to indicate when current is on.

Notes.

Shannon Scheme Progress.

A survey is now being made in connection with the cables to carry energy generated by the Shannon scheme on a loop from Limerick *via* Tipperary, Cahir and Clonmel, to Waterford, and thence to Cork, Mallow, Killarney and Tralee, back to Limerick. The first loop, work on which is now well advanced, runs from Dublin, *via* Maryborough, Kilkenny, to Waterford and through Wexford, Arklow and Wicklow to Dublin. Current to Cork will not be available until the spring of 1929. Transformer stations are being provided at Dublin, Cork, and Waterford, each to be fed at 100,000 volts. An agreement has been arrived at between the Free State Government and the Limerick Corporation for a supplementary supply of electricity—250 kilowatts at 1½d. per unit—from a temporary power station at the Ardnacrusha section of the Shannon scheme works.

Hackney Extensions Scheme.

The Hackney Electricity Committee has prepared a scheme for a 40,000-kW extension to its electricity undertaking which it has proposed should be put before the London and Home Counties Joint Electricity Authority and the Electricity Commissioners as an alternative and more economical scheme of progress, if the Hackney generating station is to continue to operate as part of the London scheme, than the proposal adopted by the Borough Council in May last for the replacement of the existing 5,000-kW set by a 10,000-kW set at a cost of £44,700. The new scheme involves an expenditure of £512,500, and is arranged in two stages of 20,000 kW each. Each stage provides, in addition to extensions to the buildings, and auxiliaries, for two steam generators with powdered-fuel plant, at a cost of £87,500 in each case, and a turbo-alternator and condenser costing £65,000. The annual capital charge for the scheme would amount to £39,560. Based on a load factor of 33⅓ per cent., the total charges of the first stage are estimated at £2 6s. 10d. per kW of demand, and the total energy charge at 0.148d. per kWh.

The I.E.E. Benevolent Fund Golf Competition.

In our last issue we commended the enterprise and kindness of the Mersey and North Wales (Liverpool) Centre of the Institution of Electrical Engineers in organising a golf competition in aid of the Institution's Benevolent Fund, which took place on July 13th at the Woolton Golf Club. Mr. G. P. Dennis presented a rose bowl for annual competition, and other prizes were given by Messrs. P. J. Robinson (chairman), F. Hartley, T. B. Morgan, and J. L. F. Vogel, and

I.E.E. Golfers at Woolton.

the British Insulated Cables, Ltd. The competition was open to members and their friends, and the result was a very representative gathering; the fight for the trophy was restricted to members. After the competition there was a dinner at the Golf House, at which Mr. P. J. Robinson presided. It is hoped that a substantial donation to the Fund will accrue and that the scheme will be taken up by other Centres of the Institution.

Our picture shows some of the competitors, with Mr. Robinson in the centre.

The Telephone Development Association.

Some 120 members and guests attended a luncheon arranged by the Telephone Development Association at the Hotel Cecil, London, on July 19th, in furtherance of the campaign for the development of the telephone service in this country. Lord Daryngton, P.C., who was Assistant Postmaster-General from 1915 to 1923, delivered an address on "The Case for More Telephones."

Sir Alexander Roger (Auto. Tel. Man. Co., Ltd.), who is chairman of the Association, presided, and the gathering included Mr. C. G. Ammon, M.P., Mr. Ll. B. Atkinson (Cable Makers' Association), Sir Geoffrey Butler, M.P., Sir William Bull, M.P., Major Sir R. W. Barnett, M.P., Sir Philip Dawson, M.P., Mr. D. N. Dunlop (B.E.A.M.A.), Dr. W. H. Eccles, F.R.S. (president, I.E.E.), Capt. I. Fraser, M.P., Sir George Hume, M.P., Mr. John Lee (Anglo-Portuguese Tel. Co., Ltd.), Sir William Noble, Mr. R. T. Nugent (Federation of British Industries), Mr. H. M. Pease (Standard Telephones & Cables, Ltd.), Lieut.-Col. Sir Assheton Pownall, O.B.E., M.P., Mr. George Terrell (president, National Union of Manufacturers), and Mr. H. Williams, M.P.

The CHAIRMAN doubted whether there was any industry in the world so stable, so remunerative, and so prosperous as the telephone industry. The Association did not propose to undertake the telephone business, its idea being that the Post Office was perfectly well equipped to do it, but they wanted it developed to the utmost.

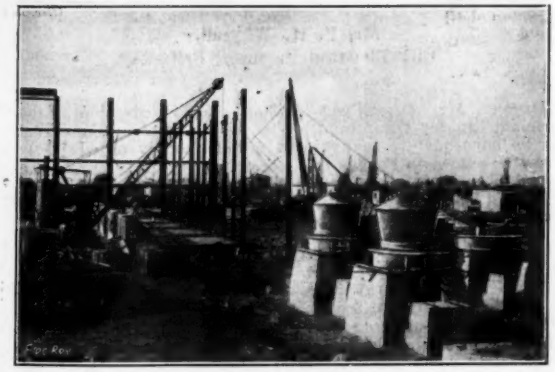
Lord DARYNGTON said that, so far as organisation was concerned, our telephone system was excellent, but the need for development was beyond question. By focusing public attention on to the utility of the telephone, and by encouraging the demand for the service, they were doing something for the community, which benefited by the additional amount of employment and the additional distribution of money. In the United States there were 150 telephones per 1,000 of population; in Denmark, 95; in Norway, 66; and in Great Britain, 31. The rate of growth in England was encouraging, but it was

capable of expansion, seeing that it amounted to something under 10 per cent. and certainly not at the rate which was calculated by the leaders of the industry, who in the last few years had more than doubled their output capacity, and in consequence their capacity to employ labour. During the last six years Great Britain had expended on additions about nine times the amount expended in 1914, whilst in U.S.A. the expenditure was over 25 times the amount expended in 1914. The virtue of Government investment in telephone service was that it had been done with a careful eye to safety, but that virtue had its limitations; it was not likely to construct plant ahead of public demand, and in such a way as was certain to attract a demand. It was this point to which independent manufacturers wished to draw attention: they thought, by the study of the response to the investment of capital in other countries, that the present expenditure should not be considered to mark the limitation of remunerative investment in telephones; the very regularity of the investments seemed to indicate a steadiness of growth which had not been characteristic of telephone growth in countries where it had been possible to lead the public demand. Manufacturers realised that the Post Office and the Treasury set out to meet the actual public demand for telephone service, but they questioned whether a bolder provision of facilities might not itself be the first means of extending the demand far beyond its present steady increase, and exercise a thoroughly healthy influence upon every aspect of national life. There were difficulties in the way of Post Office advertising, but advertising was essential at the present stage. Whether it could be done by some organisation receiving a percentage of the rentals obtained as the result of its efforts, or by some combination between manufacturers and the Post Office, ought to be considered.

Mr. Ll. B. Atkinson proposed a vote of thanks to Lord Daryngton, and Sir William Noble (in the absence of Sir Hugo Hirst) proposed a vote of thanks to the chairman.

The Congella (South Africa) Power Station.

The Congella power station is the fifth of the South African Electricity Supply Commission's undertakings, three stations at Colenso, Witbank, and Sabie being already in operation, while those at Salt River (Capetown) and Congella (Durban) will probably be in operation about April, 1928. The chairman of the Commission is Dr. H. J. Van der Bijl, and Mr. A. M



The Congella Power Station Site.

Jacobs is senior engineer and Commissioner, while Mr. J. Fowler Brown, construction engineer for Natal, is in charge of the Congella work, being assisted by Mr. E. T. Clifford-Jones; the local manager for the Commission is Mr. John Roberts, borough electrical engineer of Durban, and the Commission's consulting engineer for all the civil work is Mr. F. E. Kanthack, with Mr. J. Ryan as assistant. Contracts for some of the plant have been placed as follows:—Boilers, coal-pulverising plant, buildings and engine-room crane, International Combustion, Ltd.; turbines, C. A. Parsons & Co., Ltd.; switchgear and cable work, A. Reyrolle and Co., Ltd.; coal-handling plant, J. & R. Niven, Ltd., Johannesburg; and transformers, Siemens & Co., Ltd. Excavation for the foundations started in June, 1926, and the coal pulverisers, as may be seen from the accompanying illustration, are in position and the boilers are already on site, while the turbines and switchgear are expected to be delivered towards the end of July. The steel stanchions have been mostly erected both for the pulveriser and boiler houses and about one-half for the engine room and switch-house. The foundations for the five turbine sets are up to basement level, and one of them is up to engine-room level. Two 12,000-kW sets are to be installed as a start and, owing to the rapid increase in the demand of the Durban Corporation, which will take the whole of the output, a further set is now under consideration, though the Commission is taking over two 6,000-kW sets and boilers at present at work at the Corporation power station. The peak load of the Corporation now stands at just over 19,000 kW, and at the present rate of increase should reach about 22,000 kW by the winter (June) of 1928, by which time it is anticipated the Commission will be supplying about 14,000 kW. Application for a licence to establish the undertaking is now being made to the Electricity Control Board, and an agreement has been entered into with the Durban Corporation for a bulk supply of not less than 60,000,000 kWh per annum, with a maximum demand of 14,000 kW, exclusive of the railway load, which is supplied from the Corporation's system, and is now the subject of discussion between the Corporation and the Railway Administration as to the terms of a fresh agreement, which, if entered into, will provide for an annual output and load of 8,000,000 kWh and 4,500 kW respectively. The price set out in the licence consists of a charge of £5 8s. per kW of maximum demand and a charge of 0.2 pence per kWh, subject to variations in the price of coal.

E.A.W. London Activities.

On July 12th a large party of E.A.W. members visited "Alster," Little Hampden, Great Missenden, Bucks., by kind invitation of Mr. and Mrs. Llewellyn B. Atkinson, who made excellent arrangements for the entertainment of the party, which was shown over the house, and during a fine interval everyone was able to admire the beautiful garden.

The last visit arranged for this summer took place on July 19th, to the B.I. Syndicate, Ltd, and members were kept interested in a talk and demonstrations on ultra-violet-ray and high-frequency apparatus by Mr. Rook-Jones, who also spoke about infra-red rays.

Miss Vera Norvick, who has had a number of years' experience as a demonstrator with a large electricity supply undertaking, has been officially appointed advertisement and circulation manager to *The Electrical Age for Women*, and also to assist Miss C. Haslett in the general work of the E.A.W. at headquarters.

Royal Agricultural Show.

With reference to our review of the electrical exhibits at the above show in our issue of July 22nd, it should be made clear that the portable power units illustrated in figs. 6 and 7 on page 162 were manufactured by the British Thomson-Houston Co., Ltd. Further, the "Farmer's Boy" power unit is manufactured by Messrs. Electromotors, Ltd., including the 5-h.p. driving motor, and a model of this was exhibited on the stand of the Electrical Development Association.

Fatalities.

At a recent inquest in Glasgow on the two men who received fatal shocks from the grab of an electric crane at Shieldhall Dock on June 30th last, it was revealed that the insulation of one of the wires which supplied the crane was worn through at the point where it joined the tube of the crane at the base. The exposed wire had come in contact with the tube, due to the swinging of the crane, and rendered the grab "alive." It was suggested that armoured cable should be used for the feed. The supply voltage was 240. A formal verdict was returned.

At Camborne, on July 11th, an inquest was held into the death of George Bishop, a motor mechanic, who was killed by an electric shock at a local garage. Evidence was given that the deceased man was heard to call out for help, and was found unconscious with a lampholder attached to a flexible in his hand; the floor was wet. Artificial respiration was tried without success. The pressure of the current supplied to the garage was stated to be 240 V a.c. A witness said that the lampholder was not insulated or earthed, and Mr. H. Clarke, Inspector of Factories, said that, in his opinion, it did not comply with the regulations. A verdict of "Accidental death" was returned.

Storm Damage.

During the severe storm which recently occurred in the Midlands, the Smethwick power station of the Shropshire, Worcestershire, and Staffordshire Electric Power Co. was flooded. In the neighbourhood of the station the water rose for several feet and broke through the bricks and mortar on to the lower portion of some of the e.h.p. switchgear, causing a considerable amount of damage to a number of important feeder cables and the lower portions of some of the switchgear. The water penetrated several of the main cables for some distance, necessitating the renewal of long lengths. Some of the switchgear parts also had to be replaced. The damaged cables rendered it impossible for a time for the Smethwick station to utilise the supply from Stourport. There were also numerous instances of consumers' switchgear and sub-stations in the area being flooded, and main cables were damaged by water in several outlying districts.

Civil Service Commission.

Forthcoming Examination for Male Assistant Supt. of Traffic (Class II) in the London Telephone Service, and Male Assistant Traffic Superintendent in the Provinces, General Post Office (18-23). Regulations and particulars, together with the form on which application must be made, are obtainable from the Secretary, Civil Service Commission, Burlington Gardens, W.1. The latest date for the receipt of application forms is September 14th. (See our advertisement pages to-day.)

Appointments Vacant.

Mains superintendent for Iraq for the Air Ministry. Junior assistant (£130) for the Barrow-in-Furness Electricity Department. Meter tester and repairer for the Borough of Southampton Electricity Department. (See our advertisement pages to-day.)

Fuel Conference, 1928.

We have received a copy of the technical programme for the Fuel Conference to be held at the Imperial Institute, South Kensington, London, from September 24th to October 6th, 1928. Lord Balfour has accepted the hon. presidentship, and Sir Alfred Mond the presidentship of the Conference, and the chief participating industries, namely, coal, oil, gas and chemicals, are strongly represented through their nominees to the Fuel Conference Committee and the Technical Committee. Representatives of additional interested organisations will be added to the Fuel Conference Committee later. The member countries of the World Power Conference are arranging to participate in the Fuel Conference to the fullest possible extent by the presentation of papers and by the attendance of fully representative delegations. In order to shorten the proceedings and to focus the attention of the Conference on the most important aspects of the subjects to be covered, apart from exceptional cases, only authoritative reports from representative bodies in each participating country will be accepted. This important international gathering has been organised by the British National Committee, with the approval of the International Executive Council, of the World Power Conference, and it will cover subjects of much importance to all industrial countries.

News from China.

We learn from a correspondent at Shanghai that after an absence of eleven weeks foreign electrical and other employés of the Shanghai-Nanking Railway returned to their respective offices on June 1st.

Accident.

W. Fairlum, electrician at the L.N.E. Railway Plant Works, Doncaster, was the victim of an accident last week by the explosion of a fuse-box to which he was fixing a wire. He received severe head injuries and burns, and was taken to the infirmary in a serious condition.

Educational.

UNIVERSITY OF BIRMINGHAM ELECTRICAL ENGINEERING DEPARTMENT.—The 1927-28 session commences on October 3rd, 1927. The full course extends over four years, and students who enter after matriculation and pass successfully the examinations at the end of each year will be entitled to the degree of B.Sc. in Electrical Engineering. Detailed syllabus, &c., can be obtained from the Registrar. (See our advertisement pages to-day.)

Exhibition of Industrial Designs.

An exhibition of industrial designs received in the recent Royal Society of Arts competition will be held at the Indian Pavilion of the Imperial Institute, South Kensington, from July 30th to August 31st. Admission will be free.

Our Personal Column.

Electrical men are invited to enable us to keep readers of the "Electrical Review" posted concerning their movements

The Southend Corporation has confirmed the action of the Electricity Committee in refusing to increase the salary of Mr. ROBERT BIRKETT, the electrical engineer and tramway manager, from £1,500 per annum. It was stated that the salary was already considerably in excess of the figure stipulated in the scale adopted by the recognised Association.

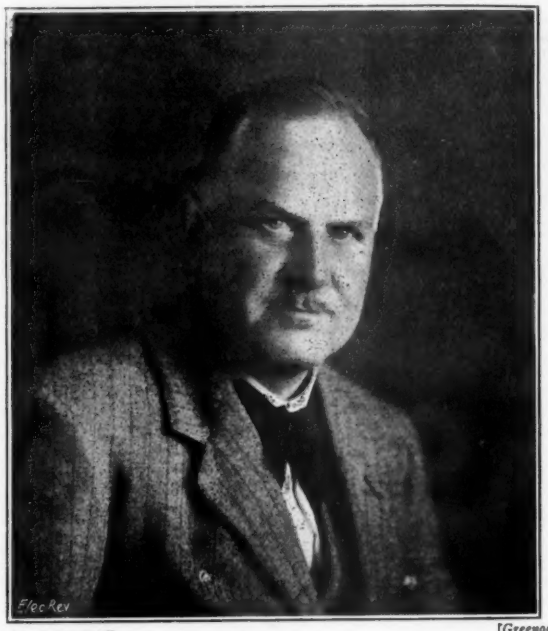
Alderman A. R. JEPHCOTT, M.P. for the Yardley Division of Birmingham, has decided not to seek re-election on the dissolution of the present Parliament owing to advancing years. He is a member of the Birmingham Electric Supply Committee, and was for some years the chairman.

Bolton Electricity Committee, on July 21st, postponed for 12 months the appointment of a successor to Mr. W. J. H. WOOD as electrical engineer. Meanwhile, Mr. H. E. ANNETT is to act as engineer in charge of the undertaking, his salary being raised to £1,000 a year, with no bonus.

The marriage took place on July 14th, at Romford, of Mr. ERIC BERTRAM ALLAM, eldest surviving son of Mr. E. P. Allam, of E. P. Allam & Co., Ltd., and Miss VERA EVELYN SEEAR, of Romford. The staff of E. P. Allam & Co., Ltd., presented the bridegroom with a pair of cut-glass flower vases.

It is announced that Sir CAMPBELL STUART has declined the chairmanship of the Pacific Cable Board, but he will continue to represent the Government of Canada thereon.

Mr. F. H. WHYSALL, M.I.E.E., the newly-appointed city electrical engineer of Belfast, has been burgh electrical engineer of Greenock for the past 12 years, previous to which he was resident engineer at the Dickinson Street and Bloom Street power stations, Manchester, for a similar period. Mr. Whysall's technical education was received at the School of Art, Rotherham, and the Technical School, Sheffield, while his practical training was obtained with the Midland Iron Co., Ltd., Rotherham, and the Sheffield Electric Light and Power Co. His early positions were assistant engineer with the Sheffield Corporation, and engineer-in-charge of the Bloom Street electricity works of Manchester Corporation during erection. During his period of office as resident engineer at Manchester (in 1913), Mr. Whysall read a paper before the Institution of Electrical Engineers entitled "The Use of a Large Lighting Battery in connection with Central Station Supply," for which he was awarded the Ayrton Premium. As burgh electrical engineer of Greenock, Mr. Whysall has carried out many important extension schemes, including the supply of electricity to the neighbouring towns of Gourock and Port



Lockhart Auld] [*Greenock.*

Mr. F. H. Whysall,
City Electrical Engineer, Belfast.

Glasgow. Mr. Whysall was secretary and vice-president of the original Linking-Up Committee for the West of Scotland, and as he subsequently inaugurated a bulk supply of electricity from Greenock to Paisley in 1924, he may claim to have taken a notable part in effecting the inter-connection of the West of Scotland 50-cycle undertakings, which is now an accomplished fact.

Obituary.—MAJOR R. HOOD-HAGGIE.—We regret to record the death which occurred at Wealdstone, Middlesex, on July 13th, at the age of 57 years, of Major Robert Hood-Haggie (late R.E.), Assoc.M.Inst.C.E., M.I.Mech.E. Major Hood-Haggie served his apprenticeship with Messrs. J. H. Holmes and Co., of Newcastle-on-Tyne, and was later outside manager and director for many years of Messrs. Ernest Scott and Mountain, Ltd. Subsequently he became managing director of Messrs. John Davis & Son (Derby), Ltd. The mention of these firms will indicate that he had made a special study of the applications of electricity in industrial works and in coal-mining, particularly coal-cutters and coal-cutting. He was also interested as a director of other, but non-electrical, industrial concerns.

HERR F. SCHUBELER.—The death recently occurred at the age of 80 years, of Herr Friedrick Schubeler, for many years chief engineer of Gebruder Sulzer, of Winterthur.

HERR B. KOHLEN.—The death recently occurred in Berlin, at the age of 71 years, of Herr Bruno Kohlen, the former chief of the telegraph and telephone department of the German Postal organisation. The deceased played an important part in the development of the telegraph and telephone system throughout Germany and also in connection with the system of telegraphic communication between Germany and other countries.

HERR E. WILL.—Herr Eduard Will, the general director of the Berne Electric Power Co., and one of the pioneers of electric power supply in the Swiss Canton of Berne, died at Berne on July 2nd, at the age of 73 years.

MR. A. C. TAYLOR.—We deeply regret to record the death which occurred at Peterborough on Tuesday last, of Mr. Alfred C. Taylor, a pioneer in X-ray work. He was a martyr to dermatitis and resigned his post as radiographer and secretary of Peterborough Infirmary last year after 45 years' service. He began his experiments more than thirty years ago, when Professor Röntgen's discovery was announced. Mr. Taylor was 66 years of age.

Will.—MR. WM. CHADBURN, chairman of Chadburn's (Ship) Telegraph Co., Ltd., left £22,351 gross and £21,986 net personalty.

Financial Section.

New Companies, Returns of Share Capital, Debenture Changes, Reports of Electrical Companies, Dividend Results, Transactions in Stocks and Shares.

New Companies Registered.

Hope's Heating and Lighting, Ltd.—Private company. Registered July 18th. Capital, £50,000 in £1 shares. Objects: To adopt an agreement with Henry Hope & Sons, Ltd., and to develop and turn to account the heating and lighting department of that company. The first directors are:—R. W. Hope 39, Portland Road, Edgbaston, manufacturer; C. T. Bassett, Hill Croft, near Bromsgove, director; A. A. Trowell, address not stated; M. H. Jones, address not stated. No qualification required. Remuneration, until otherwise determined: £500 per annum, free of income tax, divided between them. Secretary: A. A. Trowell. Registered office is at Halford Works, Smethwick.

British Electric Pari-Mutuel, Ltd.—Private company. Registered July 18th. Capital, £500 in £1 shares. Objects: To carry on the business of electricians, electrical engineers, and manufacturers of electrical machinery and apparatus, &c. The permanent directors are:—F. Howard, 8, Bloomsbury Square, W.C.1 (director of Luncheon and Sports Club, Ltd.); A. G. Clark, 109, Gloucester Terrace, W.2 (director of Plessey Co., Ltd.). The amount remaining undischarged of moneys borrowed or raised by the directors (otherwise than by the issue of share capital) shall not at any time exceed £50,000 without the sanction of a general meeting. Secretary: I. Ll. Jones. Registered office: 7, Ely Place, E.C.1.

H. A. Lee, Ltd.—Private company. Registered July 18th. Capital, £1,500 in £1 shares. Objects: To acquire the business of an electric lighting, power and motor engineer, carried on by H. A. Lee at 531, London Road, Westcliff-on-Sea. The permanent directors are:—H. A. Lee, 531, London Road, Westcliff-on-Sea, electrical engineer (chairman and managing director); H. G. White, 47, Fernleigh Drive, Leigh-on-Sea, chartered electrical engineer. Solicitor: W. H. Gipps Kent, 110a, High Street, Southend-on-Sea.

Burovox, Ltd.—Private company. Registered July 18th. Capital, £3,000 in £1 shares (1,500 5 per cent. cumulative preferred participating and 1,500 ordinary). Objects: To adopt an agreement with S. C. Winfield-Smith, to acquire the trade mark "Burovox" and to carry on the business of dealers in apparatus and appliances of all kinds for the transmission of telephonic and telegraphic communications, electricians, &c. The subscribers (each with one preferred participating share) are:—H. E. Barley, 23, Haymarket, S.W.1, director of companies; S. C. Winfield-Smith, 48, Rupert Street, W.1, engineer. Registered office: 48, Rupert Street, W.1.

Electrona Electrical Products, Ltd.—Private company. Registered July 20th. Capital, £1,000 in £1 shares. Objects:—To acquire the business of an electrical and general engineer, &c., carried on by H. V. Cooke at 13, Friday Street, Manchester, also to carry on the business of radio and automobile engineers, &c. The directors are:—H. V. Cooke, Denbigh Villa, Chester Road, Hazel Grove, Cheshire, engineer; C. V. Stead, 46, Cavendish Road, West Didsbury, Manchester, salesman; A. Deakin, The Heath, Lacey Green, Wilmslow, Cheshire, salesman.

S. Evans & Sons, Ltd.—Private company. Registered July 20th. Capital, £1,200 in £1 shares. Objects:—To acquire the business of electrical and wireless engineers, plumbers, &c., carried on at 16a-18, King Street, Maidenhead, as "S. Evans & Sons." The directors are:—S. Evans, Senr., The White House, St. Mark's Road, Maidenhead, newsagent; S. H. Evans, 16a-18, King Street, Maidenhead, electrical engineer; F. W. Evans, 28, St. Luke's Road North, Maidenhead, electrical engineer. Registered office: 16a-18, King Street, Maidenhead.

Park Radio and Engineering Co., Ltd.—Private company. Registered July 22nd. Capital, £1,000 in £1 shares. Objects; To carry on the business of general and electrical engineers, wireless telegraphy manufacturers, and dealers in the apparatus and accessories connected therewith, &c. The directors are:—G. R. Judge and Priscilla J. Judge, 676, Romford Road, Manor Park, E.12. Secretary: R. H Dutchman. Registered office: 122-3, Moorgate Station Chambers, E.C.2.

Peterborough General Electric Co., Ltd.—Private company. Registered July 19th. Capital, £500 in £1 shares. To carry on business as electrical engineers, &c. The first directors are:—C. J. Millen, 29, Belham Road, Peterborough, electrical engineer; E. V. Swiffin, Rookwood, Orme Road, Peterborough, electrical engineer. Secretary: E. V. Swiffin. Registered office: 8a, Cowgate, Peterborough.

Official Returns of Electrical Companies.

Winfield & Reeves, Ltd.—Debenture dated July 8th, 1927, to secure £300, charged on the company's property, present and future, including uncalled capital. Holder: J. Riley, 231, Wandsworth Road, S.W.

F. Smith & Son (Southampton), Ltd.—F. Woolley, incorporated accountant, of 5, Portland Street, Southampton, was appointed receiver on July 11th, 1927, under powers contained in debenture dated May 23rd, 1924.

L. H. Robinson & Co., Ltd. (formerly Robinsons Engineering Co., Ltd.).—G. S. Hyams, C.A., of 31-33, Bishopsgate, E.C.2, was appointed receiver on July 13th under powers contained in debentures dated March 14th, 1927.

Eddystone Components, Ltd.—Debenture and second debenture, both dated June 30th, 1927, to secure £1,000 each, charged on the company's undertaking and property, present and future, including uncalled capital. Holders:—A. Marsden, 4, James Street, Salterforth, near Colne; and A. Bird, 13, Mincing Lane, Blackburn.

Friho Manufacturing Co., Ltd.—Debenture dated July 4th, 1927, to secure £500, charged on the company's undertaking and property, present and future, including uncalled capital. Holder: E. O. Spanyol, 11, Buckland Crescent, N.W.3.

Bayliss, March & Newey, Ltd.—Debenture dated July 12th, 1927, to secure £300, charged on the company's undertaking and property, present and future, including uncalled capital. Holder: W. C. C. Gell, 36, Waterloo Street, Birmingham.

Northern Counties Electricity Supply Co., Ltd.—Trust deed dated July 6th, 1927 (supplemental to trust deed dated July 14th, 1905, securing £100,000 debenture stock) charged on land in Richardson Street, Ashington, and a moiety of the front, side and back streets immediately opposite the said land up to the middle line of the said streets. Trustee: W. F. Whitwell, Clockwood House, Yarm, Yorks.

Foots Cray Electricity Supply Co., Ltd.—Capital, £20,000 in £1 shares. Return dated April 14th, 1927. 15,000 shares taken up. £10,000 paid. £5,000 considered as paid. Mortgages and charges: £3,800 5 per cent. debentures.

Burgess Hill and District Electric Supply Co., Ltd.—Capital, £10,000 in 4,000 7 per cent. "A" preference, 3,000 6 per cent. preference, and 3,000 ordinary shares of £1 each. Return dated March 15th, 1927. All shares taken up. £9,900 paid on 4,000 "A" preference, 2,900 preference, and 3,000 ordinary. £100 considered as paid on 100 preference shares. Mortgages and charges, £1,200 debenture.

Wadebridge and District Electric Supply Co., Ltd.—Capital, £3,450 in 1,250 preference and 2,200 ordinary shares of £1 each. Return dated May 14th, 1927. All shares taken up. £460 paid. £2,990 considered as paid. Mortgages and charges, £850.

City of Buenos Aires Tramways Co. (1904), Ltd.—Capital, £1,240,000 in £5 shares. Return dated March 1st, 1927. All shares taken up. £1,240,000 paid. Mortgages and charges, £171,037.

Thames Valley Electric Supply Co., Ltd.—Capital, £100 in £1 shares. Return dated April 21st, 1927. All shares taken up. £100 paid. Mortgages and charges, nil.

Matthews & Yates, Ltd.—Capital, £22,050 in £50 shares. Return dated December 31st, 1926 (filed May 28th, 1927). All shares taken up. £6,000 paid on 120. £16,050 considered as paid on 321. Mortgages and charges, £20,000.

Midland Electric Wire Co., Ltd.—Capital, £5,000 in £1 shares. Return dated April 27th, 1927. All shares taken up. £5,000 paid. Mortgages and charges, nil.

Basson Electrical Co., Ltd.—Capital, £500 in 100 preference and 400 ordinary shares of £1 each. Return dated December 15th, 1926 (filed April 1st, 1927). 202 ordinary shares taken up. £202 paid. Mortgages and charges, nil.

Magnold (Bristol), Ltd.—Capital, £1,000 in 600 preference and 400 ordinary shares of £1 each. Return dated May 30th, 1927. All shares taken up. £400 paid on 400 ordinary shares. £600 considered as paid on 600 preference shares. Mortgages and charges, nil.

Wortex Manufacturing Co., Ltd.—First mortgage debenture dated July 15th, 1927, to secure £2,000, charged on the company's undertaking and property, present and future, including uncalled capital. Holder:—W. C. Burr, 3, Chatham Road, Wandsworth Common, S.W.

Brundall and District Service Co., Ltd.—Mortgage dated July 1st, 1927, to secure £1,500, charged on Central Chambers, St. Andrew's Street, Norwich (freehold). Holder:—Mrs. V. M. Dawson, The Nest, Grand Avenue, Pakefield, Lowestoft.

Sheffield Welders, Ltd.—Mortgage on 101, Trent Street, Sheffield (freehold), with plant, &c., dated July 1st, 1927, to secure all moneys due or to become due from the company to the National Provincial Bank, Ltd.

Para Telephone Co., Ltd.—Trust deed dated June 30th, 1927, to secure £10,000 and a premium of 5 per cent., charged on the company's undertaking and property, present and future, including uncalled capital. Trustees, Ethelburga Syndicate, Ltd., 65, Bishopsgate, E.C.

Harrow Electric Light and Power Co., Ltd.—Capital, £50,000 in 6,667 ordinary and 3,333 preference shares of £5 each. Return dated March 3rd, 1927. All shares taken up. £50,000 paid. Mortgages and charges: £25,000.

A. Harper, Ltd.—Capital, £6,000 in £1 shares. Return dated May 12th, 1927. All shares taken up. £6,000 paid. Mortgages and charges, nil.

Childs Electrical Stores, Ltd.—Capital, £1,000 in £1 shares. Return dated December 31st, 1926 (filed April 5th, 1927). All shares taken up. £2 paid, £998 considered as paid. Mortgages and charges: £502 15s.

Llanelly and District Electric Supply Co., Ltd.—Capital, £500,000 in £1 shares (250,000 preference and 250,000 ordinary). Return dated March 29th, 1927. 250,000 preference and 200,000 ordinary shares taken up. £444,300 paid, £6,000 considered as paid. Mortgages and charges: £279,581.

City Notes.

Crompton & Co., Ltd.

The annual meeting was held on July 25th, Mr. A. A. Campbell Swinton (chairman) presiding. In moving the adoption of the report (*vide* our issue of July 15th, p. 114) the chairman said that the prolonged coal strike had had a disastrous effect on many industries, and in face of the resultant dislocation of trade he thought the shareholders would view with satisfaction the increased profits. The report was adopted.

Separate meetings of the preference and ordinary shareholders and a combined meeting were then held, at which resolutions were agreed to for amalgamating the company with the business of Messrs. F. & A. Parkinson, Ltd. The chairman, in explaining the reasons for the amalgamation, said that during the last few years there had been a good deal of competition in the electrical manufacturing industry. Prices had been low, and profits, generally speaking, small. The business of Crompton & Co. had been carried on at a profit, but in view of the continuance of keen competition, the directors welcomed the suggestion of Messrs. Parkinson for a scheme of amalgamation between the two concerns as likely to be in the interests of the shareholders. Cromptons' works at Chelmsford were laid out for the manufacture of a comparatively large range of apparatus. Messrs. Parkinsons' factory at Guiseley was designed for the manufacture in quantity of alternating current machinery up to a certain size. They had succeeded in building up a large and profitable business, and it appeared to the directors that a combination of the two businesses would result in increased trade, many economies, and correspondingly improved profit. Their works director and another member of the board visited Messrs. Parkinsons' works, and their auditor had examined their accounts, and as a result of a very careful study of the present position and future prospects of the combined businesses the directors had come to the unanimous conclusion that the amalgamation scheme was one which they were justified in recommending to the shareholders. The scheme provided that Crompton & Co. purchased the whole of the issued share capital of F. & A. Parkinson, Ltd., at the price of £200,000. The shareholders of Messrs. Parkinson's had agreed to accept in payment of the purchase price 30,000 8 per cent. preference shares of £1 each in Crompton & Co., to be issued as fully-paid and 50,000 deferred ordinary shares of £1 each issued at a premium of 48s. per share. That premium would bring in £120,000, which would appear as a reserve. The present 7 per cent. non-cumulative shares were to become 8 per cent. cumulative preference shares, and the present ordinary shares were to become 6 per cent. cumulative preferred ordinary shares. Neither of those two classes of shares would have any right to participate in any surplus profits, nor, in the event of liquidation, in any distribution of surplus assets. With regard to the directors he (the chairman) would remain a director for three years, and two of his colleagues would also remain on the board. Three had retired, to make way for three nominees of Messrs. Parkinsons'. Mr. Siddeley, one of the retiring directors, in supporting the scheme, remarked that he represented a holding of 250,000 ordinary shares in Crompton & Co. During the short time he had been a director of the company, he had earnestly considered Crompton's position, and he perhaps viewed the situation from a different point of view to that of the older directors. He found it was a business which was one of the oldest established electrical manufacturing businesses in this country, enjoying a very high reputation for its manufactures and maintaining the highest possible traditions such as they would expect from such a firm, whilst at the same time keeping itself in the forefront through its technical ability and sound construction. On the other hand, he found that as a result of its having been established for so long, its range of manufactures extended over too large a variety of electrical goods, bearing in mind the capital employed in the business and the manufacturing capacity of the works; and in a great measure he attributed the disappointing financial results of the company to that cause. For those reasons he thought that the shareholders of Crompton & Co. were to be congratulated upon the suggestions which were put forward by Messrs. Parkinson for an amalgamation of the two concerns.

North Wales Power Co., Ltd.

The accounts for the year ended December 31st last show a profit of £49,977, and the balance, after meeting debenture interest, is £15,950. To this is added £24,101 brought forward, making £40,051. Of this £15,000 has been transferred to a special renewals fund and the balance to a special interest reserve account. Since the end of the year a further £200,000 4½ per cent. guaranteed debenture stock has been issued, and the total amount guaranteed by the Government has been increased to £2,000,000 by an additional loan of £300,000. It is reported that the sales of energy increased by 60 per cent.; the energy has had to be purchased pending the completion of the hydro-electric works which is anticipated before the end of the year. The meeting was to be held yesterday (Thursday).

Joseph Lucas, Ltd.

The final dividends for the six months ending August 31st have been declared on the "A" and "B" preference shares.

French Companies.

The *Compagnie des Appareils Electriques Vega* reports net profits of 82,000 fr. for 1926; the dividend is 7 per cent.

The *Compagnie des Ateliers de Constructions Electriques*, Metz, reports gross profits of 302,000 fr. for 1926, most of which has been set aside for depreciation and doubtful debts.

Swiss Company.

The *Watt Company for Electrical Undertakings*, Glarus, proposes to pay a dividend of 2½ per cent. for 1926 out of net profits of 121,000 fr., as compared with the same rate and profits of 103,000 fr. in 1925.

Chinese Company.

The report of the *Compagnie de Tramways et Eclairage de Tientsin* for last year shows that there was an increase of 28 per cent. in the electric tramway receipts and of 3.4 per cent. in those from electricity supply for lighting and power purposes. In order to meet the increasing demand a new steam turbine and generator of 6,800 kW capacity is being installed at the power station.

Companies Struck off the Register.

The names of the undermentioned companies have been struck off the register, and such companies are thereby dissolved:—

Britannic Electrical Co., Ltd.
Enamelled Wires, Ltd.
Froggatt's Electric Lighting Co., Ltd.
Goodall Electric, Ltd.
Grasse & Cannes Electric Tramways Syndicate, Ltd.
New Process Electric Lamp Co., Ltd.

East Anglian Electricity Supply Co., Ltd.

The net profit for the year ended March 31st last was £11,130, as compared with £8,536 for 1925-26. To this is added £1,770 brought forward, making £12,901, which is distributed as follows:—Six per cent. dividend (against 5 per cent.); depreciation, £5,705; renewals reserve, £500; general reserve, £3,000; carried forward, £1,765. The meeting was to be held on Wednesday last, when a resolution providing for the creation of 150,000 new £1 ordinary shares (making the capital £250,000) was to be submitted.

Herbert Morris, Ltd.

Half-yearly dividends have been declared on the 5 and 6 per cent. cumulative preference shares. The dividend on the former is free of tax up to 6s. in the £.

Chelsea Electricity Supply Co., Ltd.

An interim ordinary dividend of 10d. per share has been declared.

Electrical Finance and Securities Co., Ltd.

An interim dividend of 5 per cent. has been declared on the ordinary shares.

Edmundsons' Electricity Corporation, Ltd.

The annual meeting was held on July 20th. Mr. P. D. Tuckett (chairman) presided, and in moving the adoption of the report and accounts (*vide* ELEC. REV., July 18th, p. 114), said that the results were satisfactory despite the unfavourable conditions. Fortunately they had ample stocks of coal at all their stations when the strike started, and consequently it was not until the latter part of the year that they were forced to resort to the purchase of inferior high-priced coal; the business did not suffer from any failure of supply. The connections again increased by over 6,000 kW, and the output by over 2¼ million kWh. The reduction of £2,134 in the profit on working local authority and other undertakings was entirely attributable to the loss of the Hamilton undertaking. The fact that it was no larger was gratifying, since Hamilton contributed over £7,000 to the profits a year ago. They had reached a rate of dividend which in some degree compensated for the lack of dividends from which the shareholders suffered in the past, and as the directors confidently expected to maintain it, they proposed to create a staff benevolent fund. The reserve showed an increase of over £130,000. Last year they sold the Inverness undertaking of the North of Scotland Company, as well as their holding in the Folkestone Company, and it was the profit of over £80,000 realised thereon and carried to reserve which accounted for the large increase. Since the close of the year the directors had taken advantage of a favourable opportunity to dispose of the company's remaining interests in the North of Scotland Company, and would shortly be realising the holding in the Bromley Company, the Bromley Council having served notice of its intention to purchase the undertaking. Both those sales would yield a substantial profit. The Board expected that the development of the other undertakings would sufficiently employ their energies and resources. At the present time they had important extensions in hand in Cornwall and the Isle of Wight, and had recently acquired a controlling interest in the Cambridge Electric Supply Co. The schedule of investments and advances showed an increase of £92,000 in share holdings, and a reduction of £27,000 in advances, which now stood at £43,477. So far as the change had any significance, it meant that the position of the sub companies was now sufficiently assured to enable the Corporation to accept shares in liquidation of advances, and indicated a very different situation to that prevailing eight years ago, when the advances amounted to £568,000. In reply to questions, Mr. Tuckett said that when they had reached the 10 per cent. stage with a subsidiary company, and could realise at a satisfactory profit, and re-invest in a small company which could also be built up to pay 10 per cent., there was a good deal to be said in favour of parting with the old investment and re-investing. The Corporation would not part with holdings just because they were showing a satisfactory return, unless there was an advantage in doing so. In the North of Scotland Company there were special reasons which made the board think it was advisable to dispose of the shares at a satisfactory profit rather than hold them and take the risks which they knew were in the background. The report and accounts were adopted.

Tottenham District Light, Heat and Power Co.

Dividends at the following rates have been declared in respect of the half-year ended June 30th:—5 per cent. preference stock, 5 per cent. per annum; 5½ per cent. preference stock, 5½ per cent. per annum; "A" stock, 7½ per cent. per annum; and "B" stock, 6½ per cent. per annum.

Brazilian Traction, Light and Power Co.

Mr. E. R. Wood (vice-president), in the course of his speech at the recent annual meeting, said that it was hoped that increased earnings would counterbalance any loss on the exchange. The immediate problem of the company was to find a market for the surplus power, but it was expected that demand would be stimulated by reasonable rates. The traffic receipts had been increased by the new closed cars, and 99 modern motor omnibuses were on order for Rio de Janeiro.

Metropolitan Electric Supply Co., Ltd.

An interim dividend of 3 per cent. has been declared on the ordinary shares, as last year.

Metropolitan Railway Co.

The directors have declared an interim dividend of 1 per cent., as compared with 1½ per cent. for the first half of last year. The interim dividend on the surplus lands stock is maintained at 1½ per cent.

Mather & Platt, Ltd.

An interim dividend of 5 per cent., free of tax, has been declared on the ordinary shares, as in 1926.

Western Union Telegraph Co.

The earnings report for the first six months of the year shows gross revenues of $66,046,044, as compared with $66,502,908 for the first half of 1926. The expenses decreased from $58,160,099 to $56,929,549, and the net income rose from $7,173,926 to $7,322,333.

Howard & Bullough, Ltd.

A quarterly dividend of 2½ per cent. has been declared.

Stocks and Shares.

MONDAY EVENING.

Echoes of Trouble.

STOCK Exchange markets are faced with another awkward settlement in regard to the account which finishes on Thursday in this week. A heavy failure in the City, involving something like £200,000, was reported a few days ago as the direct outcome of the speculation along the lines unhappily laid by the late Mr. James White. It had been hoped that most, if not all, of the trouble in connection with the Beecham Trust receivership had been surmounted a fortnight ago, and the news of this further heavy failure struck a renewed blow at the confidence which was just beginning to return. With the holiday season at hand, enterprise is restrained for the various seasonal reasons current at this time of year, and business is therefore quiet in most departments of the Stock Exchange. The principal feature in our price-list is a sharp fall in Metropolitan Consolidated ordinary stock.

Metropolitan's Poor Dividend.

This drop in Metropolitan, which lowered the price from 58½ to 54½, followed the announcement of an interim dividend of 1 per cent., as compared with 1½ per cent. paid a year ago. The market had been looking for a repetition of the latter rate, and the reduction of ½ per cent. gave an unpleasant shock to the railway market. For the whole of last year, the Metropolitan paid 3 per cent., taking £100,000 from its reserves to do so. It is now being asked what the company is likely to pay for 1927. Underground Electrics are lower, because of the opposition that has developed to the directors' proposal with regard to modifying the position of the 6 per cent. income bonds, but nothing abates the strength of Districts, the price of which has further improved to 64¼. The disappointment caused by the Metropolitan dividend announcement had no effect upon the prices of the company's prior-charge stocks, of which there is but a moderate supply available in the market.

Electricity Debenture Stocks.

The available amount of gilt-edged debenture stock in electrical and kindred companies continues to be exceedingly small. About £10,000 County of London Electric 5 per cent. new debenture stock, issued at 96, can be obtained at 96¼, free of stamp and fee, the yield being £5 3s. per cent. on the money outright, and £5 5s. 3d. allowing for redemption. The first interest payment is one of 28s. 1d. per cent., due in December. London Power 5 per cent. debenture stock can be bought at 97½, with April and October dividends, paying 5½ per cent. on the money, and West Midland Joint Electricity Authority 5 per cent. stock is available at the same price, with the same interest dates. The first payment on this last-named stock is, however, 12s. 6d. per cent. next October.

Lancashire Electric 5 per cent. debenture stock, which came out lately at 95, can be bought at 95¼, free of stamp, and there is a small quantity of Llanelly and District Electric 5 per cent. debenture stock to be secured at 90 x.d., this giving £5 11s. per cent., a yield that is raised by about 5s. when redemption is allowed for. Electrical Finance and Securities 5½ per cent. debenture stock offered at 97½, pays £5 12s. 9d. per cent., and £500 South Wales Electric Power 5 per cent. debenture stock at 81 x.d., giving £6 3s. 6d. per cent. on the money, is on offer at the moment.

Preference Shares on Offer.

The list of preference shares offers a wider scope, and an average yield of about 6 per cent. on the money can be obtained by investment in shares ranging in character from the Westminster Electric 4½ per cent. preference to Sevenoaks and District Electric 8 per cent. preference. British Electric Traction 6 per cent. cumulative participating preferred stock at 120 yields £5 13s. 6d. per cent. on its present dividend basis of 8 per cent. British Electric Transformer 7 per cent. preference at 18s. 6d. give £7 11s. 3d. per cent. Atlas Light and Power 7 per cent. preference can be bought at their par price of 20s.

Electricity Supply Dividends.

The Chelsea Electricity Supply Company announces an interim dividend of 10d. per share, payable on September 15th, and the Metropolitan Electric Supply a dividend of 3 per cent. actual, payable August 12th. Both of these are less tax. The Metropolitan dividend is the same as that of a year ago, but the capitals of both companies were reorganised last winter, and it is difficult to make a comparison in the case of the Chelsea Co. The Metropolitan announcement had the effect of raising the price to 30s., and electricity supply shares are firm throughout the list, the only exceptions being falls in Newcastle ordinary to 22s., in Midland Counties to 21s. 6d., and in London Electric preference to 5 9/16ths. Westminsters strengthened to 25s. 6d., Charing Cross to 26s. Edmundsons continue their advance, and are again 1/16th higher at 33s. 9d. Newcastle 7 per cent. preference gained the 6d. shed by the ordinary shares. Electrical Finance and Securities has paid an interim dividend of 5 per cent., less tax.

North Wales Power.

The North Wales Power Company, which, it will be remembered, obtained the sanction of the Government for a recent offer of a further £200,000 4½ per cent. guaranteed debenture stock under the Trades Facilities Act, is making progress, but the accounts for last year show the modest profit of £50,000. The company's share capital consists of £709,000, in addition to which there is £277,000 in 8 per cent. "B" debenture outstanding, and £1,700,000 of the 4½ guaranteed debenture T.F.A. stock. The price of the last-named is 92, at which the yield on the money is a little under 5 per cent., interest payments being due on May 1st and November. The price of the ordinary shares stands about 7s., and proprietors look to the future for the reward of their patience. The company is at present in the development stage, and its money is required to lay plans for the future. As these mature, so, of course, will profits increase, and the shares are a good example of those in which the buyer who looks ahead will be content to invest money, with the prospect, necessarily speculative, of doing very well in years to come.

Hydro-Electrics.

The argument is not infrequently heard amongst investors that of all branches of industry water power is that which offers greater security and prospect than any other. This contention rests upon the fact that whatever fluctuations may occur in the prices of material, whatever difficulties may arise in the industrial world, the hydro-electric companies are unaffected as regards their main source of energy, which is derived, of course, from Nature herself. Some of the power companies, not only here, but abroad, could tell of innumerable difficulties that seem to offset natural advantages, but the prosperity (in most cases) of the American utility companies, and the way in which Italy is being opened up through the obtaining of cheap electrical power, owing to the range of mountains which runs from north to south, are examples of the manner in which the harnessing of Nature can be made, in spite of all handicaps, a very profitable and constantly increasing source of revenue to capital employed in it. So popular are some of the big utility companies in America that they have attracted the attention of the bogus company promoter and his pernicious schemes. Not even the boasted 'cuteness of the United States citizen can shield him from heavy losses through subscription to much the same sort of proposals as have caused people in this country a lamentable loss of money. We expect that experience in America is not unlike that which is familiar on this side of the water, and that prospectuses of electrical companies which have not the slightest chance of success, serve their purpose in attracting, by unlimited promise and plenty of big type, the money of the investor who is equally simple and uninformed.

Cable and Wireless.

Cable stocks are steady, the only noticeable movement being a rise of a point in Anglo-American Telegraph preferred. The Eastern Telegraph Company has announced reduced cable rates from this country to the Union of South Africa, to take effect from next Monday. Week-end telegrams are to cost no more than 4d. a word, that is, a fifth of the reduced ordinary telegram rate. The wireless group is quiet, with Canadian Marconis steady at 5s. 10½d. It is evident from official statements which have appeared that, although control of the Canadian Marconi is not to pass out of British hands, there has been a good deal of buying on behalf of the American Radio or other United States interests. It is announced that wireless telephony is to be established between Berlin and Buenos Aires.

Foreign Traction.

Brazilian Tractions have got into an upward stride once more, the common gaining 3 points, while the preferred rallied to 141. Anglo-Argentine second preference gave way to 3 7/16ths. There is not a great deal going on in traction issues. A tip circulates to buy Kalgoorlie Electric Power and Lighting shares, the price of which stands about 7s. 3d. The purchase might be reasonable for the use of money that its possessor can afford to play with. Perak River Hydro Electric Power ordinary shares have gained a few pence at 5s. 6d.

Equipment Shares.

United River Plate Telephones, after being 9¾, picked up to 9¾. Telephone Manufacturing went back a shade to 6s. 4½d. The equipment section has for one feature the strength of Johnson & Phillips, which are ½ higher at 2 7/16ths. General Electric moved up to 30s. Small gains accrued to Siemens and British Aluminiums. Enfield ordinary at 3¼ have shed a trifle. Iron and steel shares display a timid disposition to improve: the timidity is seen in the extreme modesty of gains that promptly are lost if the rise happens to tempt shares to market. Nothing of consequence is happening in rubber, where everyone seems to be as confident of a rise in prices as he is loath to back his opinion with a purchase of rubber shares. It is a common thing, however, to hear the argument that a man may be better advised to buy in a rising market than to put money into shares at a time when apathy and staleness suggest that prices may go lower before they improve.

Share List of Electrical Companies.

	Nom.	Dividend. 1925.	Dividend. 1926.	Price July 25 1927.	Rise or fall.	Yield. p.c.
HOME ELECTRICITY COMPANIES.						
Bournemouth and Poole	£ 1	14	14	59/6	—	4 14 1
Brompton Ordinary	1	10	8¾	25/-	—	5 12 0
Charing Cross Ordinary	1	15	8½	26/-	+6d.	5 7 8
do. do. 4½ Pref.	1	4½	4½	17/6	—	5 2 10
Chelsea	1	12	8¾	25/-	—	5 12 0
City of London	1	15	10	27/6	—	7 5 6
do. do. 6% Pref.	1	6	6	22/6	—	5 6 8
Clyde Valley	1	8	8	30/6	—	5 5 0
County of London	1	15	7½	28/-	—	5 0 0
do. do. 6% Pref.	1	6	6	22/6	—	5 6 8
Edmundson's Ordinary	1	8	10	33/9	+1/8	5 18 8
do. 7% Pref.	1	6	7	24/6	—	5 14 3
Elec. Supply Corporation	1	10	10	32/-	—	6 5 0
Kensington Ordinary	1	15	8	25/6	—	6 5 6
Lancs. Light and Power	1	7½	7½	26/-	—	5 15 5
London Electric	1	10	8½	24/-	—	5 16 8
do. do. 6% Pref.	5	6	6	5 5/8	—⅛	5 7 10
Metropolitan	1	11	8	30/6	+1/-	4 13 4
do. 4½% Pref.	1	4½	4½	17/-	—	5 8 6
Midland Counties	1	5½	8	21/6	−6d.	5 11 7
Newcastle-on-Tyne Ordinary	1	7	5	22/-	−6d.	4 10 11
do. 5% Pref.	1	5	5	17/6	—	5 14 3
do. 7% Pref.	1	7	7	25/-	+6d.	5 12 0
Notting Hill 6% Pref.	10	6	6	10½	—	5 17 1
North Met. Elec. 6% Pref.	1	6	6	22/-	—	5 9 1
St. James' and Pall Mall	5	17½	8	25/6	—	5 9 10
South London	1	15	8½	25/-	—	5 12 0
South Metropolitan Pref.	1	7	7	1¼	—	6 8 0
Urban Ordinary	1	7	7	25/-	—	5 12 0
do. 6% Pref.	1	6	6	1 1/8	—	5 13 0
Westminster Ordinary	1	15	8½	25/6	+6d.	5 9 10
Whitehall Elec. Invst. 7½% Pref.	1	7½	7½	20/9	—	7 4 7
Yorkshire Elec.	1	8	8	30/-	—	5 6 8
HOME RAILS.						
Central London Ord. Assented	Stock	4	4	71	—	5 12 8
Metropolitan	,,	5	8	54½	−5	5 10 2
do. District	,,	3½	3½	64½	—	5 8 6
Underground Electric	£1	Nil	1½	19/-	—	1 11 7
do. do. Income	Bonds	6	6	101	−1	*5 18 10
TELEGRAPHS AND TELEPHONES.						
Anglo-Am. Tel. Pref.	Stock	6	6	103	+1	5 16 6
do. Def.	,,	1½	1½	25	—	6 0 0
Automatic Telephone	1	8	10	46/3	−1/3	4 6 6
Chili Telephone	5	5	6	7⅞	—	3 17 5
Eastern Extension	10	10	10	18	—	*5 11 1
Eastern Tel. Ord.	Stock	10	10	180½	—	*5 10 10
Globe Tel. and T. Ord.	10	10	10	18½	—	*5 7 5
do. do. Pref.	10	6	6	11	—	5 8 1
Great Northern Tel.	10	20	20	29½	—	7 0 4
Indo-European	25	8½	10	45½	—	*5 7 6
Marconi	1	Nil	Nil	18/9	—	.. ..
Marconi-Marine	1	7½	8¾	26/3	—	6 13 4
Oriental Telephone Ord.	1	12	12	53/9	—	*4 9 4
United R. Plate Tel.	5	8	8	9¾	—	*4 2 1
Western Telegraph	10	10	10	17½	—	*5 14 3
HOME AND FOREIGN TRAMS, &c.						
Anglo-Arg. Trams First Pref.	5	5½	5½	3 7/8	—	8 4 4
do. do. 2nd Pref.	5	6	6	3 1/8	—⅛	8 14 6
do. do. 5% Deb.	Stock	5	5	72½	—	6 17 11
British Electric Traction Ord.	,,	8	8	119	—	6 14 6
do. do. 6% Pref.	,,	6	6	118½	+1	6 15 0
Brazil Traction	100	5	6	170	+3	3 10 7
Brit. Columbia Elec. Rly. Pcc.	Stock	5	5	88½	+1	5 18 0
do. do. Preferred		8½	6½	124	—	5 1 0
do. do. Deferred	,,	8	8	158	—	*5 1 3
do. do. Deb.	,,	4½	4½	79½	—	5 6 11
London & Sub. Trac. 5% Pref.	1	Nil	Nil	7/6	—	Nil
London United Tram. Deb.	Stock	4	4	51½	—	7 12 5
Mexico Trams, 5% Bonds	—	5	5	80½	—	6 4 3
Mexican Light Common	100	Nil	Nil	42	—	Nil
do. Pref.	100	Nil	Nil	67½	—	Nil
do. 1st Bonds	—	5	5	72½	—	6 17 0
Yorkshire (West Riding)	1	5	—	8/9	—	.. ..
MANUFACTURING COMPANIES.						
Babcock & Wilcox	1	13	13	52/6	—	4 19 1
British Aluminium Ord.	1	12½	10	45/-	+1/8	4 8 10
British Elec. Transformer Pref.	1	Nil	7	18/3	—	7 18 6
British Insulated Ord.	1	15	15	68/9	—	4 7 3
Brush Ord.	1	10	10	26/3	—	7 12 4
Callenders	1	15	15	3½	—	4 5 9
do. 6½% Pref.	1	6½	6½	23/9	—	5 9 5
Crompton Ord.	1	Nil	Nil	15/-	—	.. ..
Edison-Swan	4/-	10	10	10/-	—	4 0 0
do. 5% Deb.	Stock	5	5	85½	—	5 17 0
Electric Construction	1	10	7½	25/-	—	6 0 0
Enfield Cable Pref.	1	7½	7½	25/-	—	6 0 0
English Electric	1	Nil	Nil	8/9	—	.. ..
do. do. Pref.	1	8	—	12/6	—	.. ..
Gen. Elec. Pref.	1	6½	6½	23/6	—	5 10 8
do. Ord.	1	7½	7½	30/-	+9d.	5 0 0
Henley	1	20	25	96/3	—	5 4 0
do. 4½% Pref.	5	4½	4½	4½	—	5 6 0
India-Rubber	1	5	5	1	—	*5 0 0
Johnson & Phillips	1	17½	12½	42/9	+½	5 2 8
Met.-Vickers Ord.	1	8	8	27/6	—	5 11 4
do. Pref.	8	8	8	28	—	5 14 9
Siemens Ord.	1	7½	7	25/6	+6d.	5 9 10
Telegraph Construction	12	10	10	27½	—	*4 6 5

* Dividends paid free of Income Tax.

Electricity Supply at Hornsey.

Recent Extensions of the Generating Station.

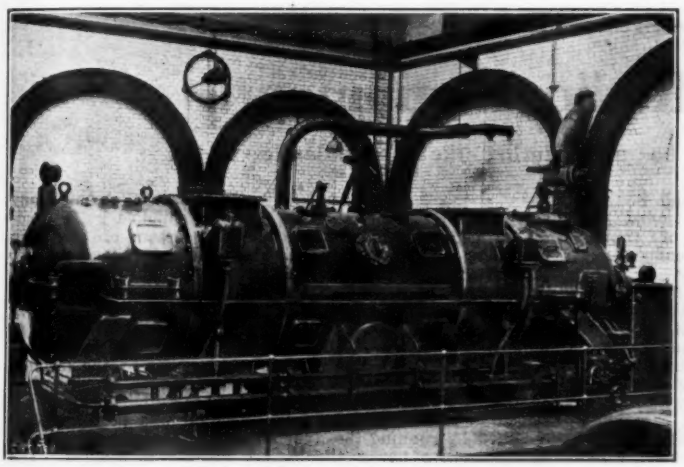
THE electricity undertaking of the residential borough of Hornsey, North London, which commenced to serve 126 consumers in March, 1903, has to-day a maximum load of 3,640 kW and 7,653 consumers. Mr. N. Staniland, M.I.E.E., is the borough electrical engineer.

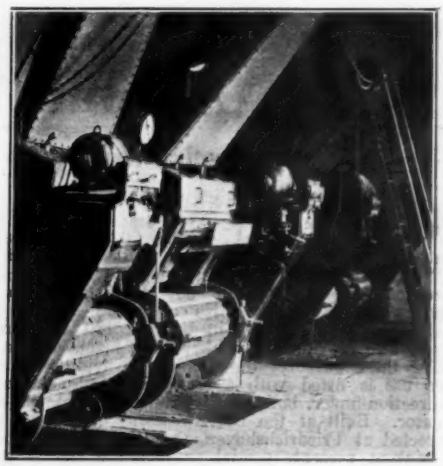
Some of the original reciprocating steam engines driving d.c. dynamos direct (2,050 kW total capacity) have been removed to make room for a.c. turbo-generators (Brush 3-phase, 50-cycle, 6,600-volt sets), the first of which commenced operation in 1922 and the second in 1925, each of 1,500 kW. In 1926 the third Brush-Ljungström machine was installed (fig. 1), of 3,000 kW, all the auxiliary plant being electrically driven, excepting the condenser air ejector, which is of the "Delas" steam-jet type; five cooling towers are available, of a total capacity of 484,000 g.p.h., the two newest being of "Premier" make.

The two most recent (fig. 2) of the six marine-type boilers, supplied by Babcock & Wilcox, Ltd., are each capable of evaporating 22,000 lb. of water per hour at a pressure of 180 lb. per sq. in., and are fitted with chain-grate stokers, driven by electric motors through epicyclic gear. The overhead bunkers are filled by means of a Temperley transporter from the railway siding alongside the works.

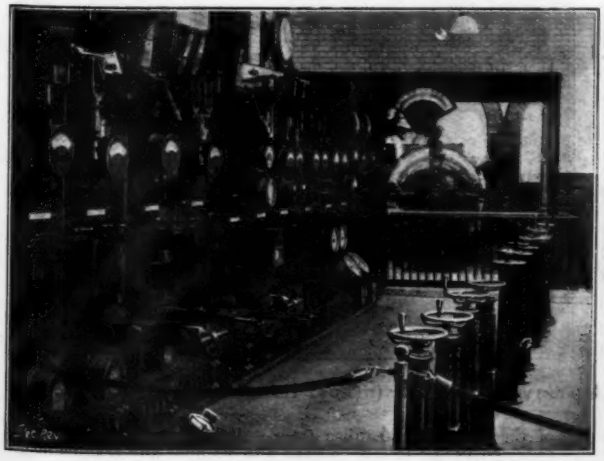
The whole of the a.c. output of the station is converted to d.c. by means of La Cour motor-convertors made by Bruce Peebles & Co., Ltd. A new convertor house has been built adjoining the engine room, and it contains three 1,000-kW and one 500-kW machines mounted on a steel structure so designed as to allow of the basement below it housing the starting gear, cable ducts, and other apparatus.

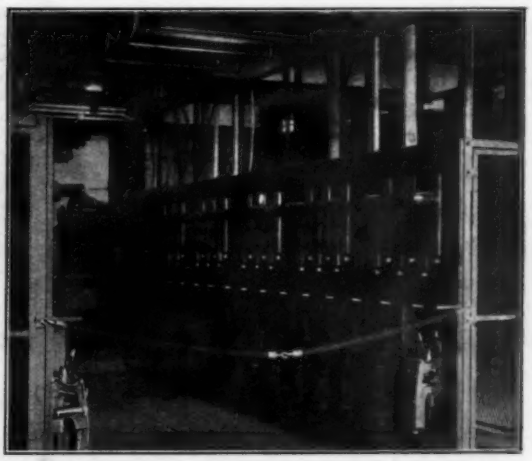
The d.c. low-voltage switchboard (fig. 3) was made by the Park Royal Engineering Co., Ltd.; all the d.c. switches for operating the convertors, old reciprocating sets, battery, &c., are assembled in one line, and opposite this board is a long desk panel, from whence it is possible to switch on or off, by electrical operation, all feeder switches in the basement below. The battery switchgear, which has been renewed and is electrically operated from the new d.c. switchboard, was installed by Messrs. Bertram Thomas.





Figs. 1 and 2.—New 3,000-kW Turbo-Generator and Boilers at Hornsey.





Figs. 3 and 4.—Direct-Current Control Board (left) and Feeder Switchgear in Basement.

In the basement, immediately below the low-voltage switchboard, are the feeder switchboards (fig. 4), one dealing with the positive side of the system and the other with the negative side; the two boards face one another and are equipped with the necessary bars for connecting up the feeders, as may be desired, and each positive and negative side of a feeder has a special electrically-controlled circuit breaker which can be operated from the desk panel on the ground floor mentioned above. The result of this convenient arrangement is that the massive conductors leading down from the low-voltage switchboard are very short and can be made mechanically sound.

The whole of the 6,600-volt switchgear has been manufactured by A. Reyrolle & Co., Ltd.

The Muswell Hill sub-station, the equipment of which was held up during the war, serves a rapidly-growing district, and now houses three 300-kW motor-generator sets; in 1924 a sub-station was erected at Highgate, and it contains one 300-kW motor-generator and one 150-kW set of equipment manufactured by the Hewittic Electric Co., Ltd. The d.c. converting plant thus consists of nine sets of 4,850 kW total capacity.

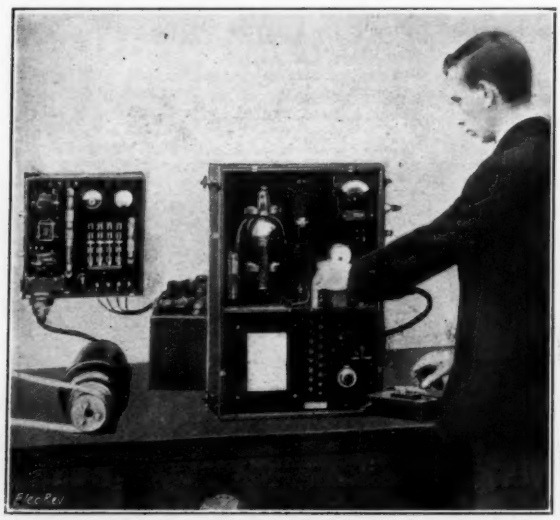
All the cables were supplied by Standard Telephones and Cables, Ltd., and the cranes by Herbert Morris, Ltd.

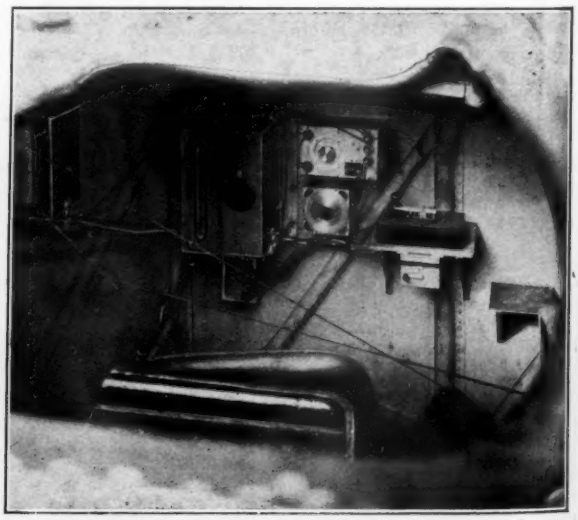
On July 16th the ratepayers had an opportunity of inspecting the development which the station has undergone when the official inaugural ceremony of the new plant was performed by Mrs. Everington. Tea was served, and the speakers included Alderman W. G. Barrenger, J.P. (the Mayor, who presided), Alderman R. Moritz, K.C. (chairman of the Electricity Committee), Capt. Euan Wallace, M.P., and Councillor P. Everington.

Aircraft Radio Equipment.

Marconi Apparatus to be used during the Transatlantic Flight.

CAPT. F. T. COURTNEY'S projected flight from Southampton to New York and back is intended to demonstrate the commercial possibilities of transatlantic aviation, rather than to be a test of endurance. "Wireless" will therefore be a vital factor of his equipment, for it will not only give him means of communicating with ships or shore stations throughout the hours he will be in the air, but the direction-finder will also provide him with an invaluable aid to navigation. For these purposes the monoplane flying boat which he is to use is fitted with a Marconi telegraph transmitter and direction-finder, both of which will be operated by the navigator. Built at the Dornier works at Marina di Pisa and erected at Friedrichshaven, the all-metal construction of the seaplane presents special problems; a special type of loop aerial has, therefore, been fitted, and a special amplifier provided with the direction-finder to give the necessary working range to the equipment. The engines, being mounted in tandem on a raised "nacelle" over the hull and completely from a mechanically-controlled winch which obviates any risk of losing the aerial. The power is supplied by a wind-driven generator mounted in the slip stream of the main propellers, and it supplies both high- and low-voltage current, the latter being used to charge a filament accumulator. The necessary switchgear, cut-out, fuses, &c., are mounted on a small switchboard, as shown in the accompanying illustration, which also carries a voltmeter and an ammeter to indicate the condition of the battery. The contingency of a forced landing on the water is provided for by the installation of a telescopic wooden mast, the top of which, when erected, will be 40 ft. above sea level. Suitable aerials are rigged to the extremities of the machine, and power will be obtained by running the dynamo as a motor generator, using as the motive power the battery already mentioned. The receiving apparatus fitted on the machine consists of Marconi (Bellini-Tosi) direction-finding equipment combining high-frequency and supersonic amplification, using, in all, twelve valves. The receiving equipment will have a working range





Figs. 1 and 2.—Radio-telegraph Transmitter (left) and Receiver and Direction-finder (right) on Transatlantic Seaplane.

enclosed in metallic cowling, cause very little interference by magneto or engine noises with wireless reception. The presence of comparatively large metallic masses in the vicinity of the direction-finding aerials is, however, a disadvantage, but a position has been found for the aerials which gives excellent results; they consist of a double loop running fore and aft, and a single loop in the plane of the wing, the terminal ends being connected by a length of cable leading to the direction-finding instrument. The telegraph apparatus consists of a 500-watt valve transmitter designed for a 600-metre wavelength, and the interrupted continuous-wave method of transmission has been chosen on account of its suitability for reception by ships. The aerial for this set is of the ordinary trailing pattern, about 200 ft. long, unwound of the order of 300 miles from suitable transmitters, and is very sensitive. It can be used also without any readjustment in the case of a forced landing, when its range should be sensibly increased owing to the greater freedom from local noises.

Wireless Set for a Village Institute.

Sir Charles Bright, F.R.S.E., president of the Wireless Retailers' Association, has presented a complete wireless installation to the local institute at Hatfield Heath. It consists of a three-valve set by the Radi-Arc Electrical Co. (1927), Ltd., with a "non-sulphating" battery made by N.S. Accumulators, Ltd.; and a loud speaker, the product of Graham Amplion, Ltd.

Two 35-kV Outdoor Sub-Stations.

Some North Wales and Cheshire Plant made by Messrs. Ferguson, Pailin, Ltd.

THE increasing number of outdoor sub-stations in this country is an indication of their popularity. The Llanfrothen sub-station described hereunder was designed and installed by Messrs. Ferguson, Pailin, Ltd., to the specification of the consulting engineers, Sir Douglas Fox and Partners, and Mr. G. K. Paton, chief engineer of the North Wales Power Co.

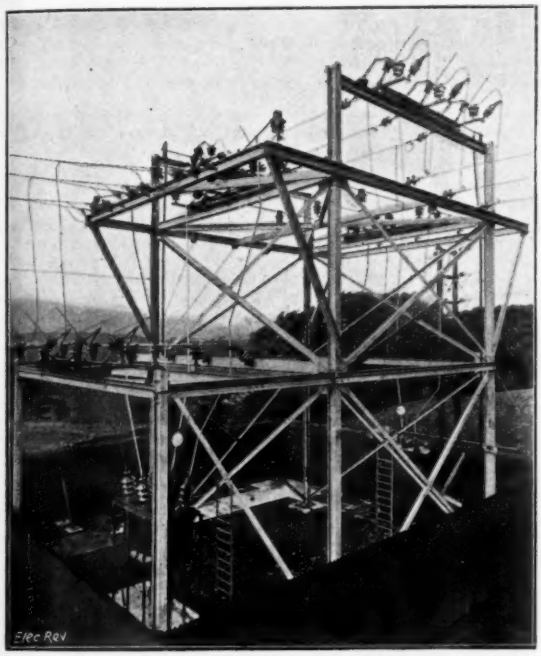


Fig. 1.—An Outdoor Sub-station in North Wales.

It is an intermediate switching point on the main overhead 35-kV feeder between the two hydro-electric generating stations of the North Wales Power Company at Maentwrog and Cwm Dyli, and was designed to connect the main overhead transmission line No. 31 (which will supply Portmadoc, Criccieth, and Pwllheli) to the main feeder No. 37. The sub-station, which is illustrated in fig. 1, also serves as a transforming point for supplying 3-phase, 50-cycle electricity at 6,600 volts to local industries, such as Messrs. Cookes Explosives Co. and the Minffordd granite quarries, for which purpose a circuit controlled by mast switches and tetra-chloride fuses is provided for feeding the step-down transformer of 500 kVA capacity.

The foundations consist of reinforced-concrete plinths, whilst the supporting structure is of rolled steel, hot galvanised after all machining operations had been performed. All the isolators, which are of the 3-pole, single-throw, rocker pattern, have horn breaks (to enable them to break the normal-load current) and are remote mechanically operated from the ground level. A locking "on" and "off" attachment has been provided to prevent unauthorised operation. The insulators are of the single-unit pillar pattern with "petticoat" weather sheds.

The circuit breaker is of the F.P. type-"VA," consisting of three single-pole units arranged for direct hand operation by means of the F.P. super-sensitive trip gear. The protective features comprise three overload coils operated from bushing current transformers located underneath the breaker top-plate; the coils are shunted by fuses, thus securing an inverse time lag characteristic. The tanks consist of reinforced welded boiler plate, braced in position by steel downrods. The breaker is frame-mounted and furnished with self-contained tank-raising and lowering mechanism for facilitating inspection of the finger contacts and elevating the live terminals to comply with Home Office requirements. Bakelite bushings are employed, the exterior portion being shrouded by porcelain insulators to provide adequate protection against the voltage "spilling over" under the action of rain and sleet. Watertight ammeters, placed in the run of the main connections, are located in the main line and transformer circuits; they appear as white spheres in fig. 1. All the connections are copper tubes with solderless connectors, and are coloured so that the phases are readily distinguishable. All the supporting framework is connected by copper strip to earth plates.

The Hartford bulk-supply station, which is shown in fig. 2, is a unique example of a combined outdoor sub-station with indoor armour-clad "filled" switchgear. It was built to the order of Mr. W. Fennell, M.I.E.E., chief engineer of the Mid-Cheshire Electricity Supply Co., Ltd.

A bulk supply through two trunk feeders is taken from the North Wales Power Co.'s 35-kV line connecting Crewe and the Mersey Power Co.'s Runcorn station; the feeders, with summation equipment, are controlled by F.P. armour-clad type-"HV" switches, the supply being led *via* single-core cables and outdoor sealing bells to the outdoor busbars from which the Mid-Cheshire Electric Supply Co. taps off two outgoing feeders.

A 5-panel control board located in a separate room accommodates the F.P. free-handle gear for the remote mechanically-operated indoor and outdoor pattern oil-immersed circuit breakers. On the incoming feeders they are interlocked so that one feeder only can be alive at any one time; each incoming feeder is furnished with triple-pole definite time-limit overload protection, and each outgoing feeder with double-pole inverse time-limit overload and instantaneous leakage protection. An ammeter with a 3-way transfer switch, to indicate the ampere loading of any phase, is provided on each feeder, whilst the bulk-supply metering instruments are accommodated on the centre panel and comprise triplicate integrating kWh-meters and maximum-demand printometers with electrically-operated timing attachments, continuous roll-chart recording ammeter and voltmeter, indicating voltmeter, and power-factor indicator.

The metal-clad switches represent the latest practice, and their leading characteristics include vertical isolation, oiled-filled instrument transformer chambers, motor-operated raising and lowering mechanism, super-sensitive trip gear, condenser bushings, and venting and anti-oil throwing devices.

The building stanchions have been extended to carry the supports for the outdoor switchgear. Triple-pole rocker-type isolators have been fitted on both sides of each oil breaker and a horn-break rocker isolator across the feeder lines permits of continuity of supply being maintained in the event of either feeder and the switching equipment on the opposite line being out of commission at the same time. The isolators are operated from inside the building. The oil breakers are of the same design as that at Llanfrothen, but special precautions have been taken in the case of both the breaker and isolator drives to prevent water entering through the roof.

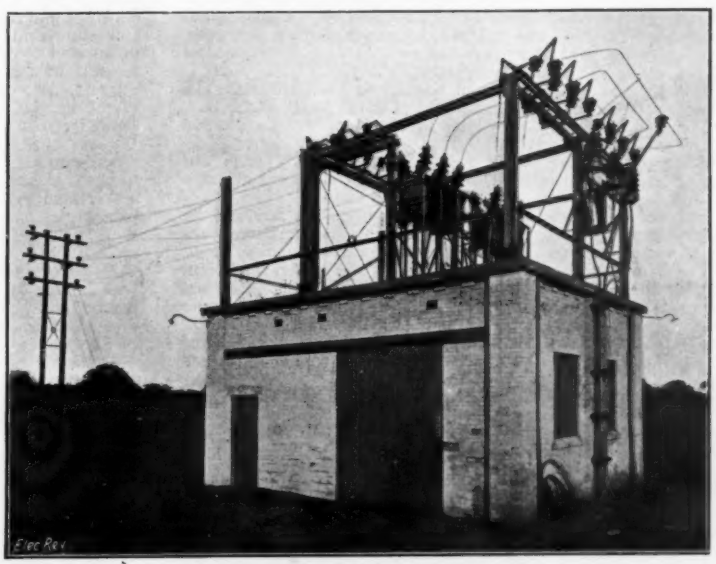


Fig. 2.—The Hartford 35-kV Sub-station.

The Ontario Hydro-Electric Commission.

A Review of the Nineteenth Annual Report.

WE have received from the Hydro-Electric Power Commission of Ontario a copy of its nineteenth annual report, covering the year ended October 31st, 1926, which, as usual, is a record of sustained progress and contains detailed accounts for the system as a whole and for each of the customer-municipalities of which there are now about 250. It is impossible to do more than mention the outstanding features of the report; in any case the mass of details is of local interest only.

The total capacity of the Commission's hydro-electric plant was 1,003,339 h.p., of which more than half (522,790 h.p.) was at the Queenston development. The other two Niagara undertakings accounted for 331,100 h.p., and thus the remainder of the systems only totalled 149,449 h.p. The total output during the year was 3,603,445,400 kWh (Niagara system 3,173,307,700 kWh). In addition to this, 192,712,303 kWh was purchased, mainly from the Canadian Niagara Power Co., giving a grand total of 3,796,157,703 kWh, as compared with 3,213,757,154 kWh in the preceding year. A table of the peak loads upon the various plants shows that in many cases the rated capacity was exceeded; for instance, the highest simultaneous load recorded by the Queenston development was 525,469 h.p. While the generating capacity in operation was sufficient to meet all power demands during the year, there were no additional plants or extensions under construction at the end of the period, except on the Thunder Bay system, and the full available capacity had a margin of only 23 per cent. over the power required, including firm power exported under contracts, but not the surplus power exported.

The load on the Niagara system increased by 45,000 h.p., but this rise was adequately covered by the installation of the ninth generator at Queenston—62,000 h.p. As the Queenston plant will develop more than twice the amount of power that the other plants can produce with the same amount of water, the general aim has been to use the quantity of water fixed by treaty with the United States at Queenston as far as load conditions and apparatus will permit. Arrangements have been made to transfer the 60,000-V load of the Toronto Power plant to Queenston when desired. A great deal of 110,000-V line work was done during the year, and the system operated practically without interruption, being out of action only 2¼ min. on one section. The Niagara system now serves about 170 municipalities and about 70 rural power districts. A long-term contract has been entered into with the Gatineau Power Co. for 260,000 h.p., and delivery of the first "block" of this will be made towards the end of next year. This power will be generated at the Gatineau River, Quebec, and transmitted to Toronto at 220,000 V.

The Georgian Bay system was enabled to operate without the purchase of power by the increased capacity and available storage at the South Falls generating station. A new plant rated at 1,120 kW was put into operation during the year, increasing the generating capacity and allowing better control of the water for use at the South Falls plant. The plant is automatic and controlled from the South Falls station. The system serves 55 municipalities and 14 rural power districts.

The load on the St. Lawrence system has shown a marked increase. Two prolonged interruptions were experienced during the year owing to the failure of the supply from the Cedar Rapids Transmission Co. In this system there are now 11 municipalities and four rural power districts.

The Rideau system load also showed a decided increase. A large amount of work upon the Cross Lake and Carleton Place dams was carried out. The system serves five municipalities.

The Thunder Bay system has the largest generating plant outside the Niagara system—that at Cameron Falls. The last two sets were put into commission during the period under review, bringing the capacity of the plant up to 75,000 h.p.; the output amounted to 198,557,600 kWh, the peak load being 49,044 h.p. The surplus capacity has permitted of the overhaul of some of the older plant. The storage in Lake Nipigon has been improved, putting the system in a very favourable position as regards water supply. The system is an isolated one, and accordingly short-wave radio communication has been established with the Commission's headquarters; telegraphy has been used, but the prospects of telephony appear to be good. The municipalities of Nipigon, Port Arthur, and Fort William are supplied by the Thunder Bay system.

The City of Fort William, at the beginning of the year, decided to provide funds for the purpose of constructing a distributing station to handle the power to be taken from the Commission in accordance with its contract—made in 1917 at the time the decision was being reached to develop power on the Nipigon River—to take power in December, 1927. This station was designed and its construction supervised by the Commission. The latter body also during the year extended its 110,000-V transmission line to provide service for Fort William, and constructed a terminal sub-station adjacent to the municipal sub-station. Both of those undertakings will be ready for operation on the date when the city ceases to take power from a private company and becomes a part of the Thunder Bay system. The initial load will be about 8,000 h.p. During the year the city of Port Arthur completed arrangements for the supply of 15,000 h.p. to two pulp and paper companies. As the present Cameron Falls development will be fully loaded with the increase in the demand for power during 1927 and 1928, inclusive of the Fort William load and that of the extensions to the two large pulp and paper mills in Port Arthur, the Commission plans to place the first unit of the Alexander development in operation at the end of 1929. The construction of this development was commenced during the year; the site is 1¼ miles below the existing Cameron Falls development on the Nipigon River.

The Ottawa system supplies only that municipality and the Nepean rural power district; the load showed continued increase, the peak rising to 16,355 h.p.

Although there was an increased demand upon the Central Ontario and Trent system, the surplus water supply over power requirements was always substantial owing to the very favourable conditions. There are two automatic plants near Campbellford. These are operated from the main plant at Ranney Falls, and have proved satisfactory. Ice conditions caused serious load interruptions during December, 1925. This system serves 30 municipalities and seven rural power districts.

The Nipissing system, serving four municipalities, reported a slight load increase.

During the past two or three years very substantial progress has been made in Ontario in the field of rural electrification. Practically all rural electrical service is now given through rural power districts, which are operated directly by the Commission. There is now more than $4,000,000 invested in these rural power district systems, and about half of this amount has been contributed by the Ontario Government in pursuance of its policy of encouraging the basic industry of agriculture. About 2,300 miles of transmission lines have been constructed to date, 750 miles having been approved during the year under review. Nearly 19,000 customers are supplied in this way. Five of the systems showed a net surplus during the year; only one failed to meet all charges, and the deficit was a small one.

The total investment of the Commission stood at $203,442,758 at the close of the year. This total included all plant, offices, and buildings, and the railways operated by the Commission. The Niagara system accounted for $155,769,666. In addition to this, the municipalities distributing systems and other assets were valued at $74,692,540, making a grand total of $278,135,299. The revenue received from municipal utilities and other customers amounted to $20,555,179. Operation, maintenance, administration, interest, and other current expenses absorbed $15,693,872, and $4,295,894 was reserved for sinking fund, renewal of plant and equipment, and contingencies, leaving a net surplus of $565,413 after providing for all expenses and necessary fixed charges, credited to municipalities and shown in their accounts. The municipalities operating under cost contracts with the Commission showed a combined revenue of $22,677,999 and expenses, including depreciation, interest, &c., of $21,500,811, leaving a surplus of $1,177,188. The Commission has total reserves of $24,751,411, and the municipalities have $30,719,802, an aggregate of $55,471,213.

In presenting the accounts of the various municipalities, the report emphasises the fact that each utility is operated at as nearly cost as possible. Sinking fund and debenture payments are treated as operating expenses, and therefore the municipalities not only pay the interest on the investment but retire the bonded debt from revenue, and, in addition, by means of an adequate reserve for contingency and depreciation purposes, provide from revenue for the perpetuity of the system. In this way 51 municipalities have entirely cleared themselves from debt, while 28 others have nearly done so. Only 25 municipalities failed to meet all charges, and the total deficit of these amounted to $127,886.

A graphic representation of the prices charged to consumers appears in the report. From this it is seen that 83 per cent. of the energy sold for domestic service is charged for at 1.9 cents or less; 15 per cent. costs from 2.0 to 3.9 cents; 1.8 per cent. from 4.0 to 6.9 cents; and only 0.2 per cent. more than 7 cents per kWh. 86 per cent. of the commercial light service is sold at 2.9 cents per kWh, or less; and 76 per cent. of the power service is sold at $25 or less per h.p. per year.

An appendix shows that the Commission had at October 31st last 3,361 miles of transmission lines, of which a mileage of 773 was operated at 110,000 V.

The section dealing with the Commission's electric street railways shows that the Essex District and Guelph District railways reported increased traffic, while that of the Toronto and York District railways declined.

Another section of the report reviews the work of the laboratories during the year. An important function of these laboratories is the testing and approval of apparatus. Sub-committees were appointed to draw up specifications for air heaters, enclosed switches, pipe straps and fractional h.p. motors. A great deal of high-pressure investigation was carried out.

New Electrical Devices, Fittings and Plant.

Readers are invited to submit particulars of new or improved devices and apparatus for publication in this Section.

A New H.O. Lampholder.

We have received from MESSRS. J. A. CRABTREE & CO., LTD., Lincoln Works, Walsall, a sample of their new "Home Office" lampholder, fig. 1, which is designed for use where complete immunity from shock is required and where corrosive action would rapidly destroy a metal lampholder. The external portions are of moulded "Jacelite," which, it is claimed, is fireproof, will not soften with heat,

Fig. 1.—The "Crabtree" Lampholder.

is non-hygroscopic and has great mechanical strength and resiliency. It gives a first-class finish. The centre moulded portion carries a brass-tube liner with bayonet slots and the necessary plungers, fitted with phosphor-bronze springs, and has a fixed projecting ring which gives a definite location to the skirt and shade carrier. A feature of the device is the unusual cord-grip adopted, consisting of two leather gripping pieces clamped between two metal bars. A rubber washer in the cap, through which the wire is threaded, protects the interior against dust, moisture, &c.

A Silent Toggle Switch.

Whilst the application of a quick-make and quick-break action has produced a switch of the highest electrical efficiency, there are certain instances where the ability to carry heavy loads is not of such vital importance as comparative silence in operation. Fig. 2 shows a one-way 5-amp. flat switch equipped with a silent toggle movement which has recently

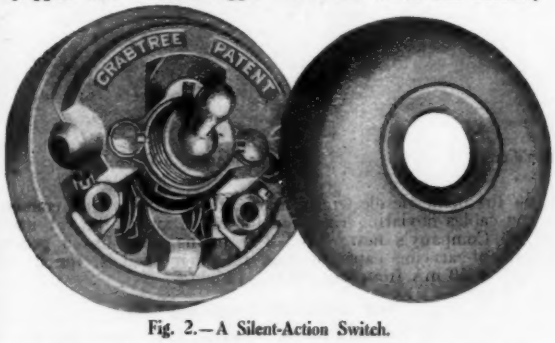


Fig. 2.—A Silent-Action Switch.

been introduced by MESSRS. J. A. CRABTREE & CO., LTD., Lincoln Works, Walsall. This switch has an underslung movement, the terminals being mounted at the top; it is available in flush, semi-recessed, insulated, "binob" and two-way types. There is said to be a reasonable demand for this type of switch for use in bedrooms, hospitals, libraries, churches, &c.

A Safety Connector.

The accompanying illustration, fig. 3, shows a clip-type safety connector which has been designed by the WESTINGHOUSE ELECTRIC & MANFG. Co., East Pittsburgh, Pa., for use where it is necessary to make separate connections on test floors in such places as college laboratories. It is supplied in two sizes, one to take a conductor up to ¼-in. diameter, and

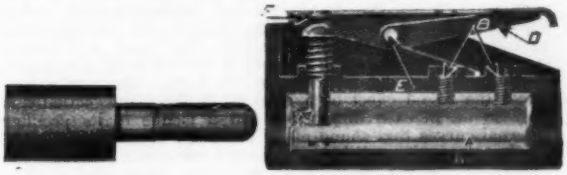


Fig. 3.—A Laboratory Connector.

the other up to ¾-in. The device consists of a casing of moulded insulation containing a brass tube A, into each end of which the conductors are fastened. A permanent connection is provided at one end by means of two set screws B, which clamp the conductor in the tube. A spring-influenced plunger C at the other end serves for the temporary connection. This is raised and lowered by means of the spring-controlled lever D, which is fulcrumed at the bearing E and normally exerts pressure on the plunger. Connector plugs can be supplied so that they can be permanently soldered to the conductor. A groove in the plug engages the plunger. An insulating button F insulates the lever from the plunger.

A New Grid Resistance.

The accompanying illustration, fig. 4, shows one of a range of resistance grids which are being manufactured by the STANDARD RESISTANCE Co., Broomfield, Chelmsford. "Eureka," 225 ohms per sq. mil ft., wire is employed, and is said to have a negligible temperature coefficient. The grid proper is held in mild-steel cross straps at the ends. The straps

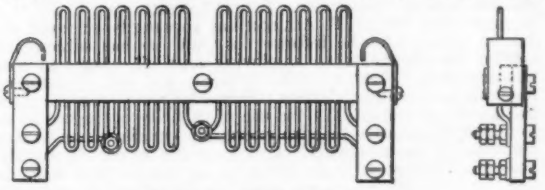


Fig. 4.—A "Standard" Resistance.

are rendered rustproof and aluminium painted. The wire is heat and electrically insulated from the straps by means of asbestos and mica strips between which the grip is clamped. Brass clamping screws are employed, and the screws, nuts and washers used for the terminals are also of brass. The terminal supports are of a strong fireproof material, heat insulated by a material to allow, in some types, a working temperature up to 400 deg. F.

A Shock-proof Lampholder.

We have received from MESSRS. H. E. ASHDOWN (BIRMINGHAM), LTD., Perry Barr, Birmingham, a sample "Ashdown" shock-proof lampholder, which they have recently put on sale. The feature of the device is the minimum number of parts of which it is constructed, nine in all. Three insulating-material portions constitute the main body of the holder with the cap and shade ring. The conducting elements are also made with three parts in each, the contact head, the spring and the plunger, as indicated in the sectional view, fig. 5. The head is drilled for the lead connection, which is gripped in position by the plunger, the far end of this being screwed and accommodated by the contact head. The plunger is held in position by a substantial spring bearing against an internal collar in the body of the holder. Thus the whole of the conducting element moves when the plunger is depressed. The standard finish is ebony black, but the holder may be supplied for use on colour schemes. A rubber plug in the cap serves both as an auxiliary cord grip and an effective sealing device for the cap against moisture. Under test an "Ashdown" holder recently withstood a deadweight of 40 lb. when suspended by means of the cord-grip only.

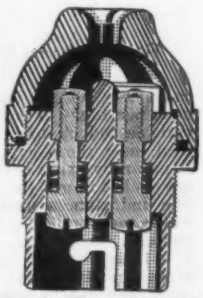


Fig. 5.—The "Ashdown" Lampholder, Section.

Selected Radio-Telephone Apparatus.

Recent Developments and Improvements.

A New American Loud-speaker.

A form of loud-speaking device recently patented by Mr. CLINTON R. HANNA and Dr. JOSEPH SLEPIAN, both members of the Westinghouse Electric Company's research staff, has an exponential horn, the underlying principle being proper coupling between the diaphragm and the surrounding atmosphere, and it is claimed to make possible the reproduction, at full volume, of the deep bass of the organ and drum; moreover, the reproducing element is said to be of a radically new type, especially adapted for the horn. The device produces the sound effect of a horn 14 ft. long, but actually is only 48 in. in each dimension, and it is due to its peculiar internal curves that sound of all pitches, low as well as high, receive accurate rendition and correct volume. Although the apparatus radiates from 10 to 20 times more volume than the ordinary loud-speaker, the amount of electrical energy represented by all this sound is only about 2¼ watts. The apparatus was not especially designed for lightness, yet there is no part of it which cannot be carried by hand, with the exception of the great wooden horn, and even that can be replaced by a lighter one at some sacrifice of volume at the lower pitches.

A Recent "Ediswan" Valve.

THE EDISON SWAN ELECTRIC CO., LTD., has sent us a sample of the latest type of valve which it has added to its range. It is of the 4-volt 0.1-amp. filament class, having a slope of 0.35 mA per volt, amplification factor of 40, and 120,000 ohms impedance. The anode voltage is 120 and the correct power valve to use in combination with it is the PV4, or the PV8 may be employed with a suitable resistance in series.

A Neutralised Circuit.

A criticism that has been levelled at most of the neutralised circuits in use, especially when applied to high-frequency amplifiers employing more than two stages, is that they do not form a true bridge, and therefore exact balance is unobtainable at all frequencies. Patent specification No. 270,531/27 shows that Mr. C. P. ALLISON has apparently achieved the desired object, and he informs us that he has successfully applied his scheme when employing four h.f. stages in conjunction with a frame aerial without the aid of damping resistances, or similar devices. It has hitherto been the practice to obtain stability by the use of capacity connected so as to introduce negative reactive energy in opposite phase to that fed back by the anode-grid capacity of the valve; it has also been the practice to apply incoming signals between the grid and filament of the valve used for amplification purposes. According to this invention, signals are applied between the grid of the valve and another point which is not necessarily at filament, or earth, potential, while stability is obtained by the use of a special double variable condenser, or two single variable condensers suitably connected, connected so as to enable a balance to be obtained, thus preventing self-oscillation in either high- or low-frequency circuits. Alternatively, two variable inductances, or a tapped single inductance, may be used, since the object is to obtain the same ratio in two arms as naturally exists between the inter-electrode capacities which are made to form the other two arms of a Wheatstone bridge. The inductances used for obtaining stability may form the whole, or part, of any output inductance used for coupling purposes, whether such inductance be tuned or not. Fig. 1 is a diagrammatic representation of one of several possible arrangements of the balancing bridge with respect to the input and output circuits, while fig. 2 shows its application to a signalling circuit embodying an amplifying valve. The capacity between plate and grid is represented by condenser C, and that between grid and filament by condenser C¹, while the balancing capacities are represented by condensers K, K¹, either or both of which are variable, one of which (*viz.*, K¹) may be the inherent capacity between the grid inductance, or tuning condenser, and low-voltage or earth. The input circuit is represented by coil I and the output circuit by coil O. The usual tuning condensers TC are connected across coils I and O. A high-resistance HR is connected between the low-voltage circuit and the grid, or a point conductively connected with the grid, and a biassing battery may be connected in series with this high resistance. This prevents choking of the grid and at the same time tends to eliminate external induction effects, for example, from noisy mains. The preferred position of HR is shown in full lines and alternative positions in dotted lines. By varying the capacities of one or both of the condensers K, K¹ so as to make the ratio of capacity of K to K¹ equal to the ratio of capacity C to C¹ and thereby balancing the two inter-electrode capacities, self-oscillation is prevented and stability of operation secured.

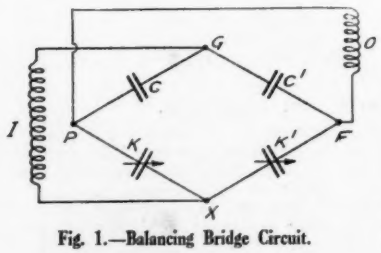


Fig. 1.—Balancing Bridge Circuit.

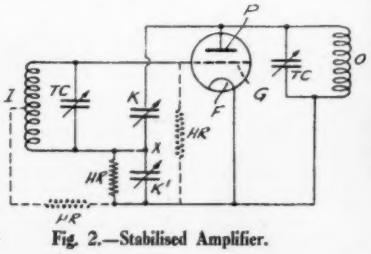


Fig. 2.—Stabilised Amplifier.

Fig. 3.—The Marconi 3-Valve Receiver.

Heavy-duty Wire-wound Resistances.

To meet the requirements of manufacturers for heavy-duty wire-wound resistances suitable for resistance-capacity coupling, potentiometers, or output resistances of battery eliminators, &c., MESSRS. BURNDEPT WIRELESS, LTD., have produced a complete new range of ten different kinds of resistors giving 32 different resistances with values ranging from 330 to 250,000 ohms. Each component takes the form of a circular black bakelite base carrying three terminals, from which rises a nickelled metal tube containing the wire-wound resistance element. The overall height of the component is 3½ in. and its diameter 2¼ in. Each resistance is tapped at, or near, the centre point, so that the full resistance of the unit is obtained by connection to terminals 1 and 3, and the two different intermediate values by connection respectively to 1 and 2 or 2 and 3, and a fourth value by connecting the two halves of the resistance in parallel. These components will be welcomed by manufacturers.

A New 3-V Receiver.

The new 3-valve receiving set of the MARCONIPHONE CO., LTD., combines "Ideal" transformer and resistance-capacity coupling, a single tuning control operating a "low-loss" condenser through a reduction drive. A special tuning unit for Daventry is incorporated in the instrument as well as an aerial reaction unit, the change-over being accomplished by means of a range switch, thus avoiding the necessity for changing coils. The standard equipment therefore covers wave bands of from 250 to 550 metres and from 1,400 to 1,900 metres, while for certain other stations which are outside the limits mentioned another aerial reaction unit (tuning between 1,000 and 2,000 metres) is obtainable. The sloping-front cabinet, fig. 3, is made of mahogany and is about 17 in. long, 13 in. deep, and 11 in. high. Two types of pedestal bases for accommodating the batteries or power units are made to fit under the receiver cabinet, greatly improving the neatness and appearance of the outfit. The set is adaptable for operation entirely off the domestic electricity mains, the use of special connecting cables obviating the need for alteration of the set itself. The Company's new "A.C.2" mains unit has a greater current-carrying capacity than its other models, for it will deliver 50 mA from the 120-volt tappings.

New American Receiving Sets.

The RADIO CORPORATION OF AMERICA, the largest concern of its kind in the United States, recently placed on the market a complete line of new broadcast receivers featuring circuits which operate in connection with either alternating or direct current supplied by the house lighting mains, thereby dispensing with all batteries. The new alternating-current receiver, said to be of unusual design, utilises three stages of radio-frequency amplification, a detector, and a two-stage audio amplifier.—*Reuter's Trade Service* (New York).

It has been known for several months that the Radio Corporation was preparing to bring out a new line of alternating-current valves, which would lead to a new type of receiver.

Unit-Type Switchgear.

The Coq Switchgear Co.'s oil-immersed apparatus, which should prove useful for rural distribution schemes.

IN the "Correspondence" columns of our issue of March 11th last, reference was made to a new type of switchgear made by the Coq Switchgear Co., which, it was claimed, would meet the ideal conditions laid down by a previous correspondent for e.h.p. switchgear used in connection with kiosk-type sub-stations. We have received from the manufacturers the following particulars of this equipment, which is made for pressures up to 50,000 V and for capacities up to 2,000 A.

A unique feature is that all the isolators, automatic switches, bus-bars, instrument transformers, and so on, are completely immersed in oil. A special patented system of grouping is claimed to avoid the crossing of any "live" parts. The isolators are of the quick-make and quick-break type, capable of being operated under full-load conditions.

By means of special rods earthing and cable testing can safely be carried out, but the rods cannot be used until the switch is in the "off" position. Automatic switches are provided with series overload trips on the standard apparatus, but any special type of protection can be adapted.

The insulating materials used are porcelain and Pertinax, the latter being made up in the makers' works. It is claimed that the rupturing capacity of the 12,000-V gear is 120,000 kVA: 24,000 V, 250,000 kVA; and 50,000 V, 1,000,000 kVA.

For outdoor operation the units are housed in an outer casing, or, as already indicated, the equipment may be installed in a sub-station of the kiosk type.

Fig. 1 shows a 12,000-V, 3-way isolator unit, complete with its casing, for outdoor installation, which should be useful in connection with rural electrification schemes; the operator is in the act of inserting an earthing rod. The overall ground-space dimensions of the unit are 3 ft. by 3 ft. 4 in. Fig. 2 is a view of the actual unit removed from its housing. Fig. 3 shows a 50-kVA kiosk sub-station equipped with this type of switchgear.

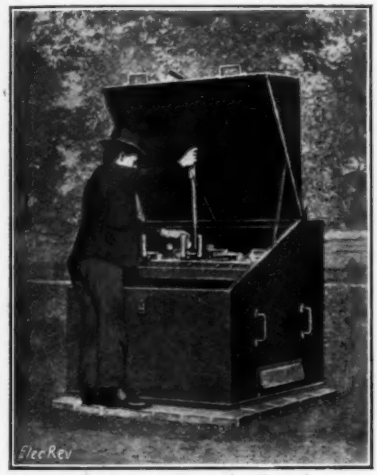


Fig. 1.—Isolator Unit with Housing.

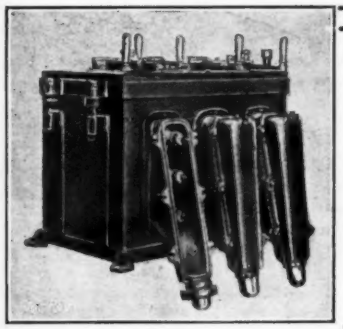


Fig. 2.—12,000-V, 3-way Isolator Unit.

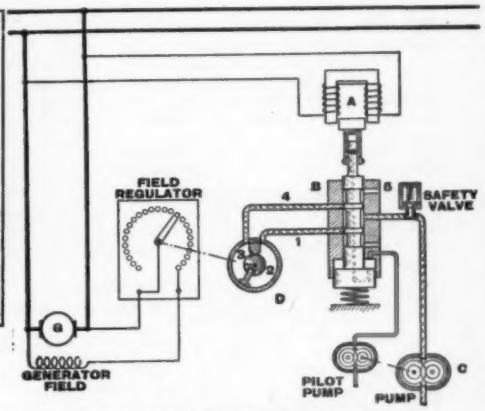


Fig. 1.—"N.C."-Regulator Operation Diagram.

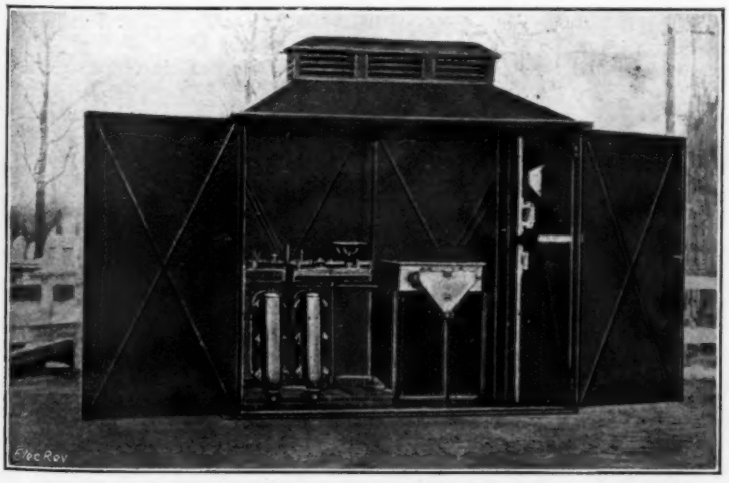


Fig. 3.—50-kVA Kiosk "sub" with Coq Switchgear.

The equipment is made up in unit form, delivered complete and ready for service, after being filled with oil. Duplicate bus-bars may also be provided when required, with the necessary change-over switchgear. The units may take any convenient formation as regards the number of poles, protective gear, and so on, and according to the service required of it. The gear is enclosed in heavy-metal housings, and suitable projections from the casing are provided for the cable inlets.

A New Voltage Regulator.

Recently introduced apparatus in which oil-pressure is employed for the necessary operating force.

WE have received the following particulars of a new type of voltage regulator, the "N.C.," which is about to be put on the market by MESSRS. ISENTHAL & CO., LTD. The apparatus is particularly simple and the mechanical design follows along well-known and proved lines.

Whilst fulfilling, it is claimed, all the functions of the well-known types of regulators designed on the vibrating-contact principle, such as the Tirrill, Olmsted, Fuss, and "MES," the new apparatus differs essentially from these in that not only are all vibrating contacts dispensed with, but the regulator is capable of producing considerable mechanical force in direct proportion to variations in voltage, current, power factor, and so on. The general design resembles very closely the regulator in common use in connection with hydraulic turbines, except that electromagnetic control replaces the centrifugal governor. A liquid servo motor is employed, which, without introducing inertia into the regulating mechanism, provides the necessary mechanical force to ensure reliability, accuracy, and quick operation, with a minimum expenditure of energy. In addition to the operation of large field regulators, the apparatus is claimed to be suitable for operating induction and regulating transformers for supply systems, electrodes of electric furnaces, and for the direct control of

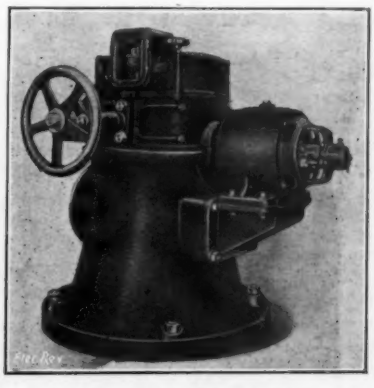


Fig. 2.—Heavy-type Regulator.

prime movers, the output of which is regulated for constant voltage.

Fig. 1 serves to explain the principle of operation. The electro-magnet A is connected across the mains or to the terminals of the generator G; between the poles is a spring-controlled armature which directly or indirectly operates a slide valve B for controlling the oil supply to the servo motor D, a suitable pump C being installed.

With a drop in the main voltage the pull of the magnet is reduced, and the armature and slide valve are moved downward. This allows the oil to enter the supply tube 1 and the servo motor space 2, whilst the oil in space 3 is allowed to escape by tube 4 and the slide-valve aperture 5 into an oil reservoir. This results in a displacement of the pump wing, and a turn of the pump spindle, to which is coupled the field-rheostat contact lever. The resulting increase of voltage leads to the attraction of the armature and upward movement of the distributing slide. As soon as the voltage has attained its normal value, both the armature and slide valve are in their midway position and no further regulation takes place. In the actual construction of the apparatus there are many refinements and additional features which, it is claimed, serve to make the mechanism still more sensitive, reduce to a minimum the number of moving parts, and secure reliability.

The pump is contained in a substantial oil tank and driven by a suitable motor.

The apparatus is very compact and may be mounted either on a panel or upon a pedestal. Very little energy is taken by the pump, which only supplies the full oil pressure during the periods of actual regulation.

Fig. 2 shows a heavy-type regulator, which has a capacity of 500 ft.-lb.

Advertising and Trade.

Some Points from the Olympia Advertising Convention.

THE following are some sentences extracted from the statements or speeches of the Prime Minister, Sir P. Cunliffe-Lister, Viscount Burnham, Lord Leverhulme, Mr. A. M. Samuel, Sir Alfred Mond, Major Astor, the Rt. Hon. W. G. Ormsby-Gore, and other speakers at the Advertising Convention at Olympia last week:—

If we are to restore our trade balance to its normal proportions we can only do it by selling more and more overseas.

To-day we are selling overseas 77 per cent. of the volume we were selling before the war, but we are importing more than our pre-war proportion, and the task before us is to get that balance right. We can only do it by selling and salesmanship.

Salesmanship can create new demands and raise the standard of living. New desires have to be met by work.

It is not the business of the buyer to hunt out the seller.

Our manufacturers study the Imperial markets less closely than they should do. American salesmen frequently seemed to understand better than British the needs and psychology of potential customers.

Heads of British businesses do not go abroad enough.

It is of no use sending out young men without authority. The heads must go.

Manufacturers and producers, and even statesmen, were beginning to realise that salesmanship was a prime attribute in political economy.

The present depression in trade and industry was not due to lack of ability to produce, but largely to inability to sell.

It is difficult in business to find round men for round holes.

The greatest difficulty is to find successful salesmen.

A fairly good salesman can be made out of fair material by careful, scientific education when he is young.

The efficient salesman is the intelligence staff of a factory.

Advertising gives salesmen support and makes their task easier.

Haphazard advertising, in whatever volume, is of very little more use in business than haphazard artillery fire in warfare.

The Press had given to the industries of the country their greatest advertising medium, and the advertiser enabled the newspapers to be produced and sold at a price which brought them within the reach of every one.

Education, the Press, and advertising represented a triple partnership.

As the salesman must study his market, a broad liberal education may be the best possible preparation for such work.

Science has no secrets up her sleeve to absolve the salesman from the duty of "serving his customer."

In picking your salesmen don't be afraid of using young men. Put into overseas markets active young men who will enter into the life of the country in which they are trying to do business.

Great help can be given by our Trade Commissioners throughout the Empire. They are men of long and wide experience.

Sales within the Empire are most important. It is vital that all parts of the Empire should mobilise and use the great goodwill that exists by effective salesmanship in each other's markets.

British firms should not individually entrust their business to an agent who also represents half-a-dozen foreign firms. Rather should our firms combine and have one representative in an overseas market. Combination in selling would reduce costs.

The most valuable form of advertising is that which makes the world buy more in the aggregate.

It is unjust to indict our salesmanship in our Imperial markets without remembering its long and honourable history, but we are now meeting competition of a sort that is comparatively new. British commercial organisation is still in something of a transitional stage.

Are there not possibilities of a greater co-operation of British manufacturers and British selling agencies in an endeavour to explore the vast potential markets of the Empire? Some form of co-operation might be used to organise an expert commission with the sole task of investigating sales problems of all kinds.

Americans are prosperous largely because America is the greatest advertising nation in the world.

If we want to maintain our position as the premier commercial country we must advertise more.

Our rivals abroad would be grateful to us if we were indifferent to the possibilities of trade within the Empire.

If we want to be supreme in Empire markets we must study their needs with painstaking thoroughness.

In Canada there is an atmosphere indicating that this country is effete, that our manufacturers are going out of business, and Great Britain has nothing to offer for the future. We must make collective effort to refute such obvious fallacies. The Dominions wanted to buy British goods.

Why not establish British trade bureaus in various places to keep British products to the front?

Manufacturer should work hand in hand with manufacturer. The British Industries Fair formed an excellent annual opportunity.

In almost every corner of our Empire there are staggering signs of expansion. New sources of wealth are constantly springing up there.

Our overseas fellow-citizens want our goods, but we cannot afford to allow sentiment to be our only salesman.

Well-directed advertising is the only substitute for personal travel.

Money was wasted on advertising because people who were prepared to pay for the white space took insufficient trouble about what they put into it.

Market analysis is an indispensable preliminary to good business.

It is no use to urge the British public to buy Empire goods unless they are told when and where to buy them.

No greater advertisement could have been conceived than that which was given by the Wembley Exhibition. The Empire Marketing Board sprang from that Exhibition.

The Empire wanted to buy British goods, but they were really depressed because they had got an altogether false impression of what our position was. The next collective effort that should be made was by industries.

There are three essentials to success—Faith, Hope and Work—and the greatest of these is Work.

Parliamentary News.

(By Our Special Parliamentary Reporter.)

The Adjournment.

On July 21st, Mr. CHURCHILL, in the absence of the Prime Minister, said that the House would probably adjourn for the summer recess on July 29th or 30th. It was proposed to reassemble for the autumn session on November 8th. Two new Bills which would be introduced during the autumn session would be the Expiring Laws Bill and the Unemployment Insurance Bill.

Electricity on Farms.

On July 19th, Mr. F. C. THOMSON informed Major Braithwaite that the Minister of Agriculture had no information as to the number of farms in this country that were equipped with electric power; but according to returns collected in connection with the last Census of Production there were then rather more than 700 electric motors in use on farms in England and Wales.

Pay of Electricians' Mates.

On July 20th, Mr. TAYLOR asked the Secretary of State for Air what was the normal working week and the rate of pay now paid to electricians' mates employed at Waddington, Digby, Cranwell, and Spittlegate aerodromes; how the present rates compared with those paid on the same date last year; and whether any further reduction in pay was contemplated by his department for this class of worker.

Sir S. HOARE said that the answer to the first part of the question was 47 hours and 47s. 9d. a week; to the second part, 57s. 4d. a week. As regarded the last part of the question a further reduction to 44s. 1d. a week would take effect as from the week ending August 4th. The rates paid a year ago were found to be in excess of those paid by local employers to which the revised rates now conformed.

Hospital Plant.

Lieutenant-Colonel HOWARD-BURY asked the Minister of Health whether he could state his reasons for withholding his sanction for the loan to be raised to provide plant for the generating of electricity for the Brentwood (Essex) mental hospital; whether he was aware that this scheme was unanimously passed by the Essex County Council and the Borough of Colchester and could be proved to be the most economical; that his commissioners had complained and reported on the leakage of gas that could be continuously detected when visiting the institution; and whether he was in favour of the only alternative, that of refitting the whole of the institution with new gas piping.

Mr. CHAMBERLAIN said that before giving a decision upon the application for sanction to a loan in this case, he had directed one of his engineering inspectors to visit the mental hospital and report fully upon the scheme. That would be done at an early date.

The London Joint Electricity Authority Bill.

The consideration of the Bill promoted by the London and Home Counties Joint Electricity Authority, under which it is proposed to erect a large power station at Chiswick, was concluded by the House of Lords Committee last week. The Committee passed the preamble of the Bill subject to a clause being inserted to the effect that the Electricity Commissioners must come to a decision within five years as to whether the station would be adopted by them as a "selected station" for the purpose of the Government's scheme. A clause was also added, limiting the power of the promoters to use the Thames for the purpose of carrying coal to the works by barge.

During the course of the proceedings prior to the Committee's decision, Sir JOHN SNELL (Chief Electricity Commissioner) was called by the Committee and stated that if he were dealing with the matter as an individual he would build the Battersea station of the London Electric Power Co. first and follow this up with the Chiswick station. He also expressed the view that the Chiswick station would probably not be needed for two or three years.

Mr. WROTTESLEY, K.C., who appeared for the Barnes Urban District Council, said that it had been made apparent by Sir John Snell that the Chiswick station was not immediately necessary. The larger station of the London Power Co. at Battersea was quite obviously intended to be erected first and engineers would clearly not erect two stations of the magnitude proposed in these cases, at the same time. He therefore asked that the site at Chiswick should not now be given to the Joint Electricity Authority, having regard to the uncertainty as to the date of erection. The House of Commons Committee would not take the responsibility of giving permission for the station to be erected at Chiswick but had inserted a proviso that it should only be erected with the consent of the Central Electricity Board.

During a discussion of clauses a large number of amendments were proposed on behalf of the Barnes Urban District Council, the great majority of which the Committee refused to allow. The Committee, however, decided to give Barnes a clause preventing the erection of cooling towers on the site at Chiswick.

The Bill was then ordered to be reported for third reading.

Legal.

Greenock Corporation v. The Admiralty.

LORD FLEMING, in the Outer House of the Court of Session, Edinburgh, on July 20th, gave judgment allowing proof before answer in the action of the Corporation of Greenock against the Admiralty for payment of £250,671, alleged to be due under an agreement made between the parties by which the Admiralty undertook to relieve the Corporation of the difference in costs as at the date during the war when expenditure was incurred in connection with the Greenock electricity undertaking and August 31st, 1923. Lord FLEMING said that the respondents had added a new plea, to the effect that the action was excluded by the provisions of the Indemnity Act, 1920. His Lordship was of opinion that the Act did not apply to the circumstances of the present dispute, and he sustained the plaintiffs' plea to the effect, and repelled certain pleas for the respondents.

I.R.G.P. & T. Works Co., Ltd., v. Western Union Telegraph Co.

MR. JUSTICE BATESON, in the King's Bench Division on July 21st, concluded the hearing of the action brought by the India Rubber, Gutta Percha and Telegraph Works Co., Ltd., to recover £3,354 balance of hire of the cable ship *Silvergray* for the repair of the Western Union Cable between Penzance and Bay Roberts, Newfoundland. The Western Union Co. counter-claimed for damages, and said that the work of repair was not done with efficiency and that the ship was not properly equipped and manned for the purpose.

His LORDSHIP came to the conclusion that the defendants failed. He believed the evidence of the plaintiffs, and that meant there must be judgment for them. He accepted the evidence of Mr. Gray and Captain Robinson, believing that the latter was a truthful witness. He was a very experienced man with an excellent character for ability given by the defendants' own witnesses, and his reputation stood very high. His Lordship thought Captain Robinson was right when he said that all cable work was a matter of luck, and luck was required to make it go absolutely smoothly from start to finish. On the other hand, he (his Lordship) thought Mr. Davidson was rather too ready to criticise without experience or knowledge. Captain Robinson was also right with regard to the navigation matters in dispute, and in fact in all matters he was to be believed. The cable in question was an old one and he estimated 88 per cent. of its life had gone. That might not be an unimportant consideration in regard to the view he took of the case. The *Silvergray* was built in 1920, and was converted for cable work. Her fittings were by Messrs. Johnson & Phillips, a well-known firm amongst the best people in the trade. The ship, when she started on her repair voyage, was extra well equipped in her cable machinery, and that was all that mattered about the ship in this case. Mr. Goddard, of the Western Union, was told the true facts about the ship, her equipment and crew by Mr. Gray at their interview, and Mr. Goddard was satisfied, and decided to charter the ship. Mr. Gray said she was competent to do the work, well equipped, had a thoroughly competent cable engineer, and a skeleton crew. His Lordship was satisfied that what Mr. Gray said was never intended to be a guarantee in a legal sense. He found there was no waste of time or of cable. The evidence of Captain Boyd for the defendants established the fact that Captain Robinson did a thoroughly good job. There would therefore be judgment for plaintiffs on the claim and on the counter-claim with costs, with an agreed amount of interest, amounting in all to £3,618.

British Thomson-Houston Co., Ltd., v. Metropolitan-Vickers Electrical Co., Ltd.

FURTHER arguments were heard in the House of Lords on July 25th by Lords Dunedin, Sumner, and Blanesburgh in this case concerning an action brought by the respondents for an injunction to restrain the appellants from infringing a patent of the year 1912 granted to Emanuel Rosenberg for an invention of improvements relating to synchronous dynamo electric machines, and for an inquiry as to damages.

In the first Court Mr. Justice P. O. Lawrence decided that the patent was invalid for want of novelty, but his decision was reversed in the Court of Appeal, though both Courts held (assuming the patent to be valid) that there had been infringement.

The question of validity was argued in the House of Lords last March, and that of infringement on July 25th, Lord Dunedin remarking that counsel might proceed on the assumption that the judgment of the Court of Appeal was right on the question of validity.

Sir ARTHUR COLEFAX, K.C., then argued that upon the construction of Rosenberg's specification contended for by the respondents the appellants had not infringed the patent.

Mr. J. WHITEHEAD, K.C., speaking for the respondents, maintained that there had been infringement.

Their Lordships reserved judgment.

Colliery Company and Officials Summoned.

AT Barnsley, on July 20th, the Wharnecliffe Woodmoor Colliery Co. and its agent and manager appeared to answer summonses for alleged breaches of the Electricity in Mines Regulations. The charges were the outcome of a fire at the colliery in April last, when three men met their death and several others were affected. The company charged Major Hudspeth, Chief Inspector of Mines for Yorkshire, with a breach of the Mines Act, but this was adjourned.

For the prosecution it was stated that the first charge was that the company had failed to provide efficient means, suitably placed, for cutting off pressure in all parts of the system. The fire originated in an eight-year-old cable, and the nearest point at which the current could be switched off was over 500 yards away. The next breach alleged was the company's failure to provide efficient means for cutting off the current automatically in the event of a fall. It was stated that the cable was capable of carrying a constant current of 77 A, but the circuit breaker attached to it was set at 300 A.

WILLIAM BROOKES, colliery electrician, said that he had tested the automatic switch, and found that it operated at 300 A. He said that the accident was not the result of any fault in the electrical apparatus. He had examined sections of the cable, and it showed no signs of overloading or overheating.

Mr. J. A. B. HORSLEY, Electrical Inspector of Mines, agreed that the cable did not look as though it had been overloaded, but it would be difficult to say accurately without more thorough examination.

Mr. HALMSHAW, for the defendants, said that although there were telephones in the pit they were not used; the men got frightened and ran away. Mr. Horsley agreed that the regulations did not limit the number of motors running on one cable. Evidence was called to show that the load curve at a time of similar output to that at the time of the accident proved that the cable was not being overloaded. Questioned by Mr. Halmshaw, Major HUDSPETH said that he did not think he had had any complaints from his inspectors with regard to the electrical equipment at the colliery. He said that the company had never intimated that it was extending the electrical installation to the place at which the fire occurred. In concluding his case, Mr. HALMSHAW said that the fire was really caused by a fall of roof; the defendants had done all that they reasonably could.

The Bench found the cases proved, and imposed a fine of £20 on the company, and of £5 each on the two officials.

Impex Electrical, Ltd., v. Weinbaum.

MR. JUSTICE TOMLIN, in the Chancery Division, last week, continued the hearing of this action in which the plaintiffs asked for an injunction restraining the alleged infringement of their trade mark, "Dario" for thermionic valves. The defendant did not deny infringement, but moved for the removal of the mark from the register on the grounds that the plaintiffs were not the true proprietors of it, and that the mark was not distinctive of their goods.

Mr. STAFFORD CRIPPS, K.C., for the plaintiffs, said that the trade mark was registered in April, 1926, and there was use of it in a warning sent out by plaintiffs at the end of August, 1926. The company had taken every step to stop infringement by the importation of French valves. The defendant was seeking to say that the infringement by the importation of French valves bearing "Dario" deprived the plaintiffs of their rights. A French company registered the same mark in France, and La Radiotechnique obtained a licence from that company to use the mark on their goods in France. Then those goods began to reach this country by devious ways, and the plaintiff company took every possible step to stop it. There was no connection whatever between the plaintiffs and La Radiotechnique.

Giving judgment, his LORDSHIP said no doubt the imported French valves were sold more cheaply here than the plaintiff company's valves. There was evidence that there had been use of the word "Dario" on wireless goods, but none that it had been used on the valves in question in this case, or on the cartons. But the plaintiff company had sold the same valves made by the French company in that company's cartons. There was no evidence that "Dario" had ever been used in connection with any goods other than the plaintiff company's, of which it was distinctive, but there was evidence of *bona-fide* use by the plaintiff company in connection with its goods. The motion failed, and the action for an injunction succeeded, both with costs.

His LORDSHIP declined to exercise his discretion and grant a certificate of validity in respect of the mark in view of other actions which he was told were pending, but he granted an inquiry as to damages.

Extension of "Rawlplug" Patent.

IN the Chancery Division on July 19th, Mr. Justice Tomlin granted an extension of four years to the Rawlplug Co., Ltd., in respect of its patent for "improved plugs or sockets for screws and other fittings," on account of disabilities encountered by reason of the war.

Marconi's Wireless Telegraph Co., Ltd.

IN the Chancery Division, on July 21st, Mr. Justice Eve postponed the hearing of this company's petition for the confirmation of the reduction of its capital from £4,000,000 to £2,374,954 until after the Long Vacation.

Correspondence.

Correspondents should forward their communications as early as possible. No letter can be published unless we have the writer's name and address in our possession.

Electricity Supply at Shanghai.

My attention has been drawn to a statement in a London paper, dated March 22nd, 1927, reading as follows:—"Practically the only light in the foreign settlements is that supplied by the searchlights of the armada of warships lying off the town."

In fairness to our European staff, I wish to absolutely deny this statement. Although all the Chinese at the power station and those employed in the Distribution Department went on strike, there was never for one moment any danger of the electricity supply being interfered with, or even curtailed, as arrangements have been in force ever since the strike in 1925 by which the service can be carried on by our European staff. Immediately we knew that the Chinese workmen were likely to walk out, additional Europeans were drafted to the power station from the Distribution and Clerical Departments, and these, together with the power-house staff, were able to maintain the service to all our consumers uninterruptedly.

The statement that the only illumination of the settlements was from the searchlights on the warships in harbour will be realised as absurd when I explain that from the south boundary of the international settlement where it joins the French concession to a point approximately four miles down the river is one continuous line of buildings—many of them of considerable height—and as the area of supply extends to a distance of eight miles beyond this, it will be apparent that, even had the searchlights been used (which, incidentally, they were not), it would have been impossible to do more than illuminate the water-front.

T. H. U. Aldridge,
Engineer-in-Chief and Manager,
SHANGHAI MUNICIPAL ELECTRICITY DEPARTMENT.

Shanghai, *June 29th*, 1927.

Electrical Salesmanship in South Africa.

I would like, through the medium of your valued columns, to point out what I consider to be an absurd practice adopted by a good many British manufacturers of electrical materials.

Firms of electrical engineers, and also suppliers, in this country are frequently being called on by manufacturers' agents, endeavouring to secure orders for electrical wiring accessories, fittings, conduit, &c. These gentlemen are just general agents, and seem to represent any firm which offers goods, from a needle to an anchor, whether electrical, mechanical, food or clothing. So far as electrical business is concerned, they know nothing of the goods they are endeavouring to sell, and are, therefore, not competent to talk to engineers and electrical firms about the merits and utility of the goods they have for sale. If any question arises as to the quality, or design, of the apparatus they are trying to push, they cannot discuss even first principles. Any complaints in connection with goods received have to be referred to their principals.

Now this state of affairs is a source of annoyance to electrical engineers, and it would be in the interests of British trade in general, and of the manufacturers particularly, if they would only appoint representatives, or agents, who have actual practical engineering experience.

Another source of annoyance is that these so-called representatives are not content with endeavouring to book orders with wholesale firms of standing, but they will also go round the same town and endeavour to fill up all the small firms and contractors with the same line of goods, quoting the same prices, whether for small or large quantities; in other words, they may succeed in securing a fairly big order from a large wholesaler, and, not being content with this, will go round and offer small firms similar parcels, thereby filling up the very man to whom the larger wholesale man would supply in the course of business.

Such is the state of affairs in the South African market; in fact, it applies equally in towns like Johannesburg, Pretoria, Cape Town, Port Elizabeth, East London, Durban, and Kimberley, and I maintain that the British manufacturer has got himself to blame entirely for losing a hold on this market, because I know positively well that business which a few years ago was done exclusively with English firms is now, owing to this pernicious system of the general agents barging in, being placed on the Continent.

I would like to ask, Mr. Editor, what the B.E.A.M.A. has to say about this.

South African Electrical Engineer.

South Africa, *July 8th*, 1927.

The Position at Croydon.

In the electrical Press last week there appears a letter from Mr. Penwill in which he questions my integrity and therefore a reply from me is required on that point.

It is true I made a verbal promise to the secretary of the Croydon Contractors' Association that I would consult with them on any scheme which I put forward to the Electricity Committee.

Mr. Penwill will remember, however, that I withdrew my promise at a meeting consisting of the president of the E.C.A., himself, and the Croydon contractors which I was asked to attend at the request of the Joint Conference responsible for the drafting of Section 48. My reason for so doing was because of the action of the Croydon contractors in getting the Chamber of Commerce to approach the Croydon Town Council with a view to a resolution being passed against the exercise of any of the powers in Section 48 of the 1926 Act whilst I was at the same time in negotiation with them for putting forward a mutually agreed scheme under this section.

As bearing on Mr. Penwill's letter, the following extract from a local paper reporting on the deputation of the Local Chamber of Commerce is rather interesting :—

"The secretary referred to the Chamber's recent memorial against municipal trading, and said that when the Electricity Committee's proposals came before the Council they were defeated by twenty-four votes to twenty-three. He thought that that result was largely due to the influence which the Chamber brought to bear on the matter. In that connection he had received a letter from the secretary of the Electrical Contractors' Association thanking the Chamber for their help in the matter."

Alex. C. Cramb.

Croydon, *July 25th*, 1927.

[A letter replying to the first part of Mr. H. R. Taunton's article on "The Economics of Electric Wiring" is unavoidably held over until next week.—EDS. ELEC. REV.]

Published Specifications.

Compiled expressly for this journal by a firm of Chartered Patent Agents. The numbers in parentheses are those under which the specifications will be printed and abridged, and all subsequent proceedings will be taken.

1925.

32,365. "Electric distant control and signalling apparatus." Schneider et Cie. December 27th, 1924. (245,135.)

1926.

277. "Sound amplifiers." F. H. Ball. August 4th, 1925. (247,532.)

2,297. "Telegraph cables with loading coils." Dr. H. W. G. Salinger and J. H. Stahl. February 10th, 1925. (247,544.)

7,655. "Transformers and other electrical apparatus and electric terminals." British Thomson-Houston Co., Ltd., and H. Trencham. March 19th, 1926. (273,370.)

7,721. "Synchronising arrangements for use in telegraph or like systems." Automatic Telephone Manufacturing Co., Ltd., H. H. Harrison, and S. R. Smith. March 19th, 1926. (273,371.)

8,272. "Coupling socket for electrical and mechanical connection." J. Rigaut. March 26th, 1926. (273,380.)

8,613. "Adjustable electric condensers and other adjustable electric apparatus." R. Atkins and Ormond Engineering Co., Ltd. March 30th, 1926. (273,392.)

8,653. "Vacuum electric tube devices." E. Y. Robinson and Metropolitan-Vickers Electrical Co., Ltd. March 30th, 1926. (273,394.)

8,662. "Multiple-circuit electric condensers." Dubilier Condenser Co. (1925), Ltd. March 30th, 1925. (250,238.)

8,722. "Driving of dynamos connected with internal-combustion engines." Douglas Motors, Ltd., and C. G. Pullin. March 31st, 1926. (273,395.)

8,731. "Electrically-maintained tuning forks or reeds." Muirhead & Co., Ltd., F. H. Muirhead, E. S. Heurtley, and J. V. Foll. March 31st, 1926. (273,398.)

8,840. "Electric heating apparatus." E. M. Young and Young, Osmond and Young, Ltd. April 1st, 1926. (273,403.)

8,910. "Alternating-current relays." Westinghouse Brake & Saxby Signal Co., Ltd. (Union Switch & Signal Co.). April 1st, 1926. (273,407.)

9,059. "Duplex telegraphy." W. G. R. Jacob and Eastern Telegraph Co., Ltd. April 6th, 1926. (273,412.)

9,724. "Telephone selectors." H. A. Gill (Deutsche Telephonwerke und Kabelindustrie Akt.-Ges.). April 13th, 1926. (273,419.)

11,218. "Systems of radio broadcast distribution." E. F. Colladay. May 21st, 1925. (252,348.)

11,866. "Automatic control of groups of dynamo-electric machines." English Electric Co., Ltd., and R. A. R. Bolton. May 6th, 1926. (Addition to 235,702.) (273,438.)

12,809. "Electromagnetic sound-reproducers such as loud-speakers." Brandes Laboratories, Inc. November 16th, 1925. (261,337.)

12,910. "Apparatus for use in electrical heating machines, more particularly welding machines." Allgemeine Elektricitäts-Ges. May 20th, 1925. (252,383.)

12,911. "Double-fluid cells." L. Darimont. May 20th, 1926. (Addition to 241,729.) (Convention date not granted.) (263,081.)

13,312. "Catenary suspension systems for electric conductors." Callender's Cable and Construction Co., Ltd., and C. W. Kay. May 26th, 1926. (273,449.)

13,527. "Electrical protective relays." T. W. Ross and Metropolitan-Vickers Electrical Co., Ltd. May 28th, 1926. (273,452.)

14,202. "Apparatus suitable for the reproduction of sound." W. J. Rickets. June 4th, 1926. (273,459.)

15,159. "Switchgear of the draw-out type." D. R. Davies and Metropolitan-Vickers Electrical Co., Ltd. June 16th, 1926. (273,472.)

16,168. "Measurement of voltage and current in connection with thermionic valves." A. Hall and Ferranti, Ltd. June 26th, 1926. (273,484.)

16,243. "Buzzers." Igranic Electric Co., Ltd., and P. W. Willans. June 28th, 1926. (273,485.)

16,281. "Storage batteries." C. H. Everett. April 12th, 1926. (269,120.)

16,282. "Storage batteries." C. H. Everett. April 12th, 1926. (269,121.)

16,456. "Electric locomotives." G. H. Fletcher and Metropolitan-Vickers Electrical Co., Ltd. June 30th, 1926 (273,486.)

16,654. "Voltage regulating systems." British Thomson-Houston Co., Ltd. July 2nd, 1925. (254,737.)

16,808. "Electric coupling." A. F. Bulgin. July 5th, 1926. (273,490.)

17,269. "Loud-speaking telephonic receivers." S. Z. De Ferranti and Ferranti, Ltd. July 9th, 1926. (273,498.)

17,527. "Electric fuses." British Thomson-Houston Co., Ltd. July 13th, 1925. (255,117.)

17,628. "Electric signalling system using polyphase high-frequency currents." Wired Radio, Inc. July 21st, 1925. (255,859.)

18,067. "Driving gear for electrically-driven locomotives." J. Buchli. July 19th, 1926. (273,507.)

18,426. "Electric rivet-heaters." F. W. Highfield and Highfield Electrical Co., Ltd. July 23rd, 1926. (273,509.)

21,664. "Trivets or stands for electric fires and radiators." H. H. Berry. September 2nd, 1926. (273,525.)

23,823. "Metal-sheathed conductors." Callender's Cable and Construction Co., Ltd., T. Petersen, and V. T. Burchall. September 27th, 1926. (273,532.)

24,828. "Thermo-electric generators." British Thomson-Houston Co., Ltd. November 27th, 1925. (262,060.)

25,065. "Means for dimming electric lamps." Dubilier Condenser Co. (1925), Ltd. February 1st, 1926. (265,139.)

25,070. "Electrical earth plates." G. Messien. November 25th, 1925. (262,061.)

25,393. "Locomotive or car trucks." British Thomson-Houston Co., Ltd. October 12th, 1925. (259,621.)

25,498. "Commutators for electrical machines." R. A. L. Vole. November 3rd, 1925. (260,970.)

26,593. "Electrical earth connections." G. S. Holland. October 25th, 1926. (273,551.)

26,680. "Metal-sheathed electrical conductors." Callender's Cable and Construction Co., Ltd., and J. Bowyer. October 25th, 1926. (273,552.)

28,729. "Thermionic valve amplifying systems." British Thomson-Houston Co., Ltd. November 14th, 1925. (261,415.)

28,941. "Bridges for frequency measuring." Felten & Guilleaume Carlswerk Akt.-Ges. March 24th, 1926. (268,287.)

30,696. "Electric incandescent lamps." Naamlooze Vennootschap Philips' Gloeilampenfabrieken. December 28th, 1925. (263,776.)

31,334. "Synchronous dynamo-electric machines." R. A. Lochner and Crompton & Co., Ltd. December 10th, 1926. (Addition to 266,853.) (273,574.)

31,422. "Motor system for a Ferraris electricity meter." Soc. Genevoise D'Instruments de Physique. March 29th, 1926. (268,288.)

31,423. "High-tension transformers." Akt.-Ges. Brown, Boveri & Cie. December 24th, 1925. (263,782.)

32,711. "Regulating transformers." Siemens-Reiniger-Veifa Ges. für Medizinische Technik. December 24th, 1925. (263,829.)

32,838. "Electric lamp sockets." J. B. Fignac. December 31st, 1925. (263,842.)

1927.

258. "Telegraph receivers." Morkrum-Kleinschmidt Corporation. December 23rd, 1924. (Divided application on 245,149.) (263,885.)

453 "Electric lamp sockets." J. B. Fignac. January 6th, 1927. (Addition to 263,842.) (273,592.)

461. "Wireless apparatus." A. S. Giles. January 7th, 1927. (273,593.)

1,730. "Safety devices for high-tension lines." O. Jacobson. January 20th, 1927. (273,599.)

2,664. "Electric transformers." British Thomson-Houston Co., Ltd. January 29th, 1926. (265,231.)

4,150. "Electric vulcanisers." O. C. Dennis. February 14th, 1927. (273,607.)

4,266. "Automatic quick-acting circuit-breaking devices." P. J. Branchu. February 15th, 1926. (266,010.)

5,636. "Electrically-operated bath-water heaters." A. Curia and G. Mazier. February 27th, 1926. (266,757.)

5,859. "Electric coils." International General Electric Co., Inc. March 2nd, 1926. (267,128.)

10,058. "Locomotives with internal-combustion engines and electric generators and driving motors." Metropolitan-Vickers Electrical Co., Ltd. April 30th, 1926. (270,272.)

13,203. "Line contactors for use with electrically-operated point turners, signals, and other interlocking plant." S. T. Quilliam. May 17th, 1927. (273,633.)

14,210. "Magnetos." E. C. R. Marks (Wico Electric Co.). February 2nd, 1926. (Divided application on 271,932.) (273,635.)

Trade Mark Applications.

THE following are among the recent applications for British trade marks. Objections against any of the proposed marks may be lodged within one month from July 20th. In the case of foreign applications, the names and addresses of the British representatives are also given :—

Sutra. No. 475,937. Class 8. Radio-telephonic apparatus and scientific instruments.—Société de Construction d'Appareillage et Specialités Electriques, Paris, and 10-12, Ludgate Hill, E.C.4.

SZ (lettering and design). No. 476,350. Class 8. Galvanic cells, dry cells, dry batteries, refill batteries, electric accumulators and parts of such goods.—Die Batterien und Elemente Fabrik System Zeiler Gesellschaft, Berlin. (Marks & Clerk, 57-58, Lincoln's Inn Fields, W.C.2.)

Pegasus. No. 477,500. Class 8. Instruments and apparatus for use in connection with radio-telegraphy and telephony, but not including accumulators or accessories thereto.—A. G. Franklyn, 95, Woodhouse Lane, Leeds.

Dudlo (lettering and design). No 478,550. Class 8. High-tension coils, meter coils and windings, and ignition coils.—Dudlo Manufacturing Co., Fort Wayne, Indiana, U.S.A. (Marks & Clerk, 57-58, Lincoln's Inn Fields, W.C.2.)

Nassak. No. 479,478. Class 8. Instruments and apparatus for use in connection with radio-telegraphy and telephony.—S. W. Nassauer, 119-125, Finsbury Pavement, E.C.2.

Nomet. No. 481,079. Class 8. Electric cables.—W. T. Henley's Telegraph Works Co., Ltd.

Olonite. No. 481,486. Class 8. Electric cables.—Greenwich Cable Works, Ltd.

Kestrolian. No. 481,552. All goods in Class 8.—T. Pearson, trading as Pearson Bros., 54 56, Long Row, Nottingham.

Helionlite. No. 479,970. Class 11. Quartz mercury vapour lamps for surgical or curative purposes.—Kelvin, Bottomley & Baird, Ltd.

Anodite (lettering and design). No. 481,375. Class 11. Instruments and apparatus and contrivances (not medicated) for surgical or curative purposes.—Compagnie Générale d'Electricité, Paris. (Cruikshank & Fairweather, 65-66, Chancery Lane, W.C.2.)

Birka. No. 478,704. Class 13. Devices for making and breaking electrical circuits.—W. A. Bristow, trading as the British Birka Regulator Co., 39, Grosvenor Place, S.W.1.

Do-Li (lettering and design). No. 479,274. Class 13. Pocket electrical lamps and parts thereof.—Die Progresswerke Hofman & Wild, Erlangen-Bruck, Germany. (Marks & Clerk, 57-58, Lincoln's Inn Fields, W.C.2.)

New Work for Contractors.

Particulars of new works and building schemes for the use of electrical installation contractors in search of work and all interested in the sale of electrical and allied plant and other products.

Publication in this list is no guarantee that electrical work is definitely included. Alleged inaccuracies should be reported to the Editors.

ALTRINCHAM.—Hospital extensions, for the Board of Governors; T. Harold Hill, architect.

AYR.—Housing scheme (368), for the T.C.; burgh surveyor.

BATHGATE.—New town hall; burgh surveyor.

BINGLEY.—Erection of grammar school; governors.

BIRMINGHAM.—Enlargement of All Saints' Church, Gravelly Hill (£7,500); Rev. C. B. Chute, curate-in-charge. Church, Hob Hove Road, Fox Hollies estate; Birmingham Diocesan trustees.

BO'NESS.—Housing scheme, for Town Council; Messrs. Steele & Taylor, architects, Bo'ness.

BOURNEMOUTH.—Electricity supply for New Pavilion; borough engineer. Additions, Wentworth College; Bournemouth Collegiate School for Girls. Club, Jamieson Road; Y.M.C.A. Committee. Estate development, Castle estate, Moordown; Coast View Land Society. Public baths, Northwood estate (£35,000), for the T.C.; borough engineer. Hospital extensions (£60,000), for the Board of Management; secretary.

BRADFORD.—Reconstruction, girls' grammar school; governors. Mental institute for 240 patients; city architect. Greyhound track, Cutlet Heights; Greyhound Racing Association.

BRISTOL.—1,000 houses (750 next 12 months); city engineer.

BURNHAM-ON-SEA.—Bank, Victoria Street, for Barclay's Bank, Ltd., London.

BURSLEM.—Reconstruction, old town hall; Cornes & Son. Electrical installation, Manchester Pottery; George Wade & Son, Ltd.

BURTON-ON-TRENT.—Dairy, with electrical equipment (£16,000 to £18,000), for the Co-operative Society; A. H. Turner, secretary.

CASTLEFORD (YORKS.).—Hotel, Pontefract Road, for Jn. Smith's Tadcaster Brewery Co., Ltd.; Garside & Pennington, architects, Ropergate, Pontefract.

CHATHAM.—Technical college, Fort Pitt, for Kent E.C.; E. Salter Davies, director of education, Sessions House, Maidstone.

CHELTENHAM.—Extension, printing works, Swindon Road; Burrows Press, Ltd.

CHINGFORD.—Public offices (£8,000), for the U.D.C.; H. T. Bonner, architect.

CHORLEY.—Hospital, for the Board of Management; W. H. Haslam, secretary.

CLIPSTONE (NOTTS.)—Church (£5,000); Rev. Day Lewis, vicar of Edwinstowe.

COVENTRY.—Works extensions, for the Hillman Motor Works Co.

CROSSHILL (BAILLIESTON).—Housing scheme (38), with electrical work, for Lanarkshire C.C.; P. C. Smith, District Offices, Hamilton.

CROYDON.—Church, Bedford Park; F. W. Jarman. Factory, Purley Way; A. & J. Main & Co., Ltd.

DALKEITH.—Library, clinic, &c., for Midlothian Education Authority (£1,600); W. Scott, architect.

DUNDEE.—Factory, for North British Linoleum Co., Ltd.; Robertson & Orchar, Wallace Foundry.

DUNSTABLE.—Wesleyan church and adaptation of premises as school hall, Harlington; trustees.

EDINBURGH.—Housing scheme (388), Gorgie Road, for the T.C.; burgh surveyor.

GLASGOW.—Extensions, Union Street and Mitchell Street; F. W. Woolworth & Co., Ltd. Hall, Dixon Road, Govanhill; Independent Labour Party.

GLENBOIG.—Housing scheme (52), for Lanarkshire C.C.; P. C. Smith, District Offices, Hamilton.

GRIMSBY.—Extensions fire station; Mr. G. H. Hipkin.

GUILSBOROUGH (NORTHANTS.).—Rebuilding of the Baptist Church and school; trustees.

HARWICH.—Premises, Kingsway; Harwich Co-operative Society.

HEMSWORTH (YORKS.).—Additional 400 houses, for the R.D.C.; surveyor.

HOYLAND (YORKS.).—Middle school (£21,000); West Riding County Education Department, County Hall, Wakefield.

HYTHE (KENT).—Arcade of 10 shops, High Street, for Messrs. Parsons, Folkestone.

LEEDS.—Estate scheme, Chapel Allerton Hall, for Sir Rowland Barran; Carby, Hall & Son, architects. Housing scheme, 42 acres, at Bramley; city architect

LONDON (E.C.).—Buildings, site of 83-86, Aldgate High Street, and 155-157, Minories; R. B. Soloman and H. D. Myer. Rebuilding South Place Chapel; trustees. Rebuilding 11 and 12, South Place; River Plate House Co.

LONDON.—*continued.*

(BARNES, S.W.).—Billiard hall, for the Mortlake and East Sheen Social Club; R. B. Rowell, architect. Extensions, refuse destructor (£10,000), for the U.D.C.; surveyor.

(BATTERSEA, S.W.).—Tenements, York Road. Library, Southlands College; borough engineer. Alterations, &c., 21-23, St. John's Road; Boot's Pure Drug Co., Ltd.

(BRIXTON, S.W.).—30 garages, rear 4, Effra Road; Horace M. Walkey.

(STREATHAM, S.W.).—Shops, flats and restaurant, 68-80, Streatham Hill; Trehearne & Norman. 22 houses, Valley Road; Collett Building Co., Ltd.

(TOOTING, S.W.).—100 houses, Bell estate; A. R. Bignell.

(DULWICH, S.E.).—Building scheme, for Lloyd's Bank, Ltd., Lordship Lane; Spencer & Kent.

(FOREST HILL, S.E.).—102 houses, Park estate; William Wilmot, Ltd.

(LEE, S.E.).—Factory extensions, Manor Lane; T. C. King and Son.

(PECKHAM, S.E.).—Reconstruction, 176-178, Rye Lane; P. J. Westwood.

(WEST NORWOOD, S.E.).—22 houses, Cheviot Road; E. W. Wallis.

(WOOLWICH, S.E.).—360 concrete houses, Eltham estate; borough engineer.

LIVERPOOL.—College, Childwall, Wavertree; Rev. Canon J. T. Mitchell, secretary, Wavertree Rectory, Liverpool.

LOWESTOFT.—Reconstruction, premises in Belvedere Road; Jewson & Son.

MARLOW (BUCKS.).—Housing scheme (24), for the U.D.C.; surveyor.

MERTHYR TYDFIL.—Re-erection of cake mills, North Street, Dowlais, for D. Jones, Dickinson & Co. (several thousand pounds).

MILL END.—Nurses' home, mental hospital; H. Carter Pegg, architect for Herts. C.C.

MILLPORT.—Improvements at town hall (£1,000); burgh surveyor.

MINWORTH (WARWICK).—Works, for the Moss Gear Co., Ltd.

NEWPORT (SALOP).—Hospital; Edmund Kirby & Sons, architects, Cook Street, Liverpool.

NORTHALLERTON.—Church hall (£4,000); the vicar.

NORTHAMPTON.—Church, Abington, for the Roman Catholic church; Canon Ashmole.

OTLEY.—Additions and new offices, Station Road; Grisedale and Sons, Station Road.

PORTSMOUTH.—Additions, 53-55, Russell Street; Portsmouth Building Society. Tenements, Hawke Street; Charity Organisation Society.

PRESTWICH.—36 houses, Highfield Road and Stanley Avenue; J. & W. Leach & Sons, Ltd.

RUBERY (BIRMINGHAM).—Church (£4,000), for the Congregational trustees; secretary.

SHEFFIELD.—Model municipal public-house on city housing estate; City Improvements Surveyor.

SLOUGH.—Housing scheme (152); Pondac, Ltd., 3, St. Mary's Terrace, Paddington, W.

SOUTH AFRICA.—Cape Town housing scheme (£50,000); city engineer.

SMETHWICK.—Church (£8,000), St. Paul's Road, for the Wesleyan trustees; secretary.

STAFFORD.—Works extensions, for F. Riley, Ltd., St. Patrick's Place, and Heels, Ltd., the Friars.

STAMFORD.—Police station, for Kesteven C.C.; Mr. Metcalf, county architect, Grantham.

STIRLING.—Re-erection of saw mills, Wallace Street, for John Kettrick (£2,000).

SUTTON COURTENAY (ABINGDON).—Electric lighting installation, All Saints' Church; the incumbent.

SWANAGE.—Secondary school, for Dorset E.C.; county architect, Dorchester.

SWANSEA.—Additions, Kilvey Church; churchwardens. Hall, St. Helen's Road; Rev. J. H. Watkin Jones, St. Faith's Church. Shopping centre, Grenfell Park estate; Grenfell Estate Co. Kinema, Mumbles; Louis Hyman.

TRURO.—Drill hall, for the Cornwall Territorial Army Association (£4,085); Lieut.-Col. the Hon. N. A. Hood, secretary, Truro.

WAKEFIELD.—Electric light in school and head teacher's house at Rotherwell; Percy Beaumont, West Riding Education Offices, 8, St. John's North.

WALTON (SURREY).—Maternity home, with electrical work (£9,483); Gaze & Sons, builders, Kingston-on-Thames.

WEYMOUTH.—Baths; borough engineer.

WHITEHAVEN.—Blocks of small-type houses; borough engineer.

WIMBORNE.—Roman Catholic church; Rev. Canon Burns.

WOLVERHAMPTON.—Factory for the Goodyear Tire and Rubber Co. (Great Britain, 1927), Ltd.

YORK.—Housing scheme, 83 acres at Heworth; city engineer.